

**ҚОРАҚАЛПОҒИСТОНДА
ФАН ВА ТАЪЛИМ**

**ҚАРАҚАЛПАҚСТАНДА
ИЛИМ ҲӘМ ТӘЛИМ**

**НАУКА И ОБРАЗОВАНИЕ
В КАРАКАЛПАКСТАНЕ**

**SCIENCE AND EDUCATION
IN KARAKALPAKSTAN**

4/1-сон
Нукус
2022 й.
ISSN 2181-9203



Science Magazine

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**SOME FEATURES OF THE ARTIFICIAL RESERVES OF THE SUBCUTANEOUS
WATERS OF THE KARAKALPAK USTYURT**

Dzhaksymuratov K.M.¹, Kholzhigitov Sh.B.², Toshev Sh.D.³

¹Research and Innovation of the Nukus Mining Institute at the Navoi State Mining and Technological University, ²Tashkent State Technical University named after Islam Karimov,

³State Establishment "Institute of Hydrogeology and Engineering Geology".

Summary: The main object of studying the conditions of accumulation of surface and underground runoff of atmospheric precipitation is the first aquifer from the surface, this article describes the geological structure. In tectonic terms, the Uru turning site on the Karakalpak Ustyurt is located within the North Ustyurt Depression on the southern slope of the tectonic structure of the Aktumsuk uplift zone, on the surface of the Karakidyr karst valley. To this day in Uzbekistan sardoby – catchments of rain and meltwater have been preserved in arid zones. Thus, the article proposes an engineering hydraulic system, which includes three auxiliary tanks located on the takyr site and removed at different distances from each other. Wells that receive water from under the takyr horizon are combined into a single system using irrigation polyethylene pipes. Consequently, water with the same volume is collected in three containers.

Key words: wells, takyrs, karst valley, depressions, precipitation, aquifer, sardoba, artificial groundwater reserves.

Introduction. The geological structure of the Karakalpak Ustyurt is considered in detail in numerous scientific works of other researchers. Of these, the monographic description of A.M.Akramkhodzhaev, articles and Reports by A.A.Bakirov, R.G.Garetsky, V.G.Vasiliev, V.N.Kunin, N.A.Krylov, A.L.Yanshin, V.M.Zheleznov, V.M.Liguti, A.S.Lalayants, G.T.Leshchinsky, L.A.Ostrovsky are particularly distinguished, V.N.Sokolova, G.V.Kulikova, A.S.Vishnyakova, etc. Due to the fact that the main object of studying the conditions of accumulation of surface runoff of atmospheric precipitation is the first aquifer from the surface, this chapter does not provide a description of the geological structure and tectonics of deep aquifers, information about which is detailed in previous chapters and in scientific papers [2, 3, 6, 7, 11, 12]. In tectonic terms, the takyr site of Uru on the Karakalpak Ustyurt is located within the North Ustyurt Depression on the southern slope of the tectonic structure of the Aktumsuk uplift zone, on the surface of the Karakidyr karst valley.

Discussion of the results. In this structure, rocks from Permian to modern sediments are present in the section of the sediments of the site [2, 3, 6, 7, 11, 12]. Here, the most interesting are the Upper Miocene deposits, represented by limestones and marls, heavily carded, fractured and slightly gypsum clays. The thickness of the horizon varies widely – from 5-20 m in elevated areas to 48-57 m in depressions. The water content of the Sarmatian deposits is not the same and varies from tenths of a liter/s to 10-14 liters/s. Limestone filtration coefficients reach 90 m/day. When considering the values of total mineralization, it should be noted that with a decrease in the amount of precipitation from north to south in the same direction, the values of total mineralization increase from 3.5 to 7-10 g/l. Down the section of the Sarmatian deposits, mineralization gradually increases and its greatest values do not exceed 15-20 g/l. According to the chemical composition of the water of the Sarmatian horizon, it is mainly of the sulfate class, the sodium group. Everywhere, precipitation is the source of the first from the surface of the aquifer.

When studying the possibility of artificial formation of subsurface fresh groundwater due to the takyr runoff of precipitation, takyr surfaces are always considered as natural catchments of precipitation; climatic conditions – precipitation forming local surface runoff.

In this dissertation study, takyr and everything related to them are accepted as a constant value over time, although there are examples of overgrowth and baldness of takyr. This means possible local geodynamic changes in the volumes of the takyr runoff.

Special scientific studies of the Institute of Deserts of the Academy of Sciences of Turkmenistan, the Aral Sea GGE, the State Institution "HYDROINGEO", the Nukus Mining Institute at the Navoi State Mining and Technological University and the Tashkent State Technical University are devoted to the study of the regime of climatic conditions, the characteristics of the runoff of subsurface waters, geological and hydrogeological conditions of takyr surfaces [1, 4, 5, 8, 9, 10].

Processing and analysis of the actual material were carried out at 16 weather stations in the Western region of Central Asia for the period 1970-2020. Currently, there is factual material on the Kungrad, Muynak, Chimbay, Takhtakupyr weather stations for 2021. Thus, the number of meteorological observations is 50 years. The analysis of the materials showed that two precipitation maxima are distinguished in the studied area: the first is spring; the second is autumn, less often winter. A characteristic feature is the variability of annual, monthly precipitation amounts over a multi-year period. It has also been established that the main role in the formation of local takyr runoff is played by rains with a precipitation amount > 5 mm.

Analysis of meteorological data for a 50-year period allowed us to conclude that the duration of low-water periods varies from 3-5 to 7-8 years, high-water periods - from 4 to 10 years. There is no pattern between the water content of the year and the nature of the distribution of annual runoff by seasons.

Thus, in the takyr section of the Uru, observers for two years of work noted up to seven manifestations of rain with an intensity from 1 hour to 5-7 hours, precipitation power ranged from 1.5 to 13 mm. Snow fell five times with a layer thickness of 3 to 7 cm. Precipitation formed a surface runoff that filled the infiltration pool by 70-80% (Fig.1). The total volume of runoff was immersed in an artificial reservoir. As can be seen from Fig.1, the coastline of the artificial reservoir is covered with shrubs and saxaul of quite impressive size. It follows from this that such filling of an artificial reservoir with manufactured waters has been taking place for several years. This is confirmed by the research of the dissertant in Karakalpak Ustyurt.

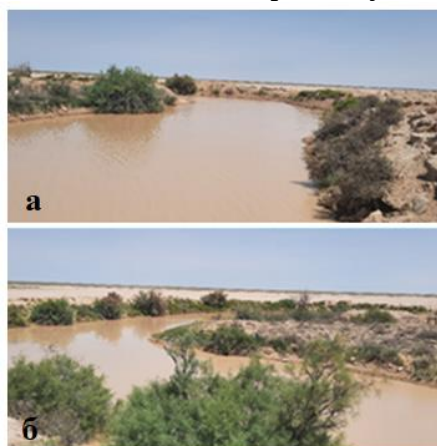


Fig.1. Takyр section of the Ural Karakalpak Ustyurt (photo by K.M.Dzhaksymuratov): a – type of artificial reservoir on the east side; b – type of artificial reservoir on the west side (condition after May rains on 21.06.22)

Practically, the geological study provided for the reanimation of previously studied experimental research works at the takyr site of the Uru, namely: conducting hydrogeological survey and reconnaissance studies, cleaning the infiltration territory of the takyr Uru, restoring hydraulic structures (locks), restoring the regime network of wells and carrying out experiments on immersion of the takyr runoff of atmospheric precipitation. Additionally, the project provided for a fragment of the pilot operation of the formed subsurface waters and the compilation of working models of engineering structures for possible options for extracting subsurface groundwater of active water exchange zones. The immersion of the surface runoff at the Uru site was carried out

through a hydraulic structure into an infiltration pool, previously cleaned of silty sediments using technical means.

Thus, the problem of using huge volumes of subsurface runoff requires a solution. However, in the conditions of modern latest achievements of science and technology, it is most likely necessary to apply accumulation and preservation of atmospheric precipitation, not associated with their immersion at the groundwater level. It becomes obvious that the successful solution of the tasks of using these waters by accumulating and storing them in artificial tanks will allow organizing the water supply of small consumers in the Karakalpak Ustyurt in a relatively short time.

Based on this, the chapter provides engineering solutions for the production of those types of research that are characteristic of work on the takyr surfaces of the Karakalpak Ustyurt in the form of covered structures "sardoba".

One of the greatest inventions of the ancestors is considered to be kyariz. This water supply system is capable of collecting water from underground horizons and transporting it to cities and irrigation canals. Thanks to this, for example, Persia was able to exist and develop in an arid climate. The hydraulic system includes a main well that receives water from the underground horizon, a tunnel system through which water is transported to a specific location, and vertical wells for ventilation along the entire route, which also allows moisture to condense. Along with this, the underground water conduit significantly reduces the evaporation of precious moisture. According to literary sources, the first Kyariz on the territory of Southern Turkmenistan and in the northern regions of Iran appeared in the middle of the I millennium BC. Turkmen legends erect the construction of kyariz by the time of Alexander the Great. Even the ancient historian Polybius reported on the kyariz of Southern Parthia, noting that whoever conducts "spring water into the area, which has not been dusted until then.", the entire region is provided for use for a period of five generations. And this is not accidental. Kyariz is a complex hydraulic structure, which is a system of wells connected by underground galleries.

Due to the arid climate, water in Central Asia has always played an important role. It was especially difficult for caravans whose path ran through the desert. Therefore, special reservoirs or sardobs were installed along the caravan roads. Sardoba is a water tank installed under a covered dome. To get to the water, a staircase was arranged. Such reservoirs were also often located at work, caravanserais and even in the cities themselves. The reservoir was more often filled with rain or meltwater, but water could also be supplied from rivers and other water sources. For this purpose, ditches or underground channels (kyariz) were installed.

The construction of Sardoba was carried out since the I century BC and continued until the XVIII century. Later they were also abandoned, as well as the caravan routes themselves. Nevertheless, many of them have survived to the present day, which made it possible to study their design in detail. Sardobs were more often located in places with low relief – to collect rain and meltwater. For the same purposes, special water intake holes were installed at the base of the dome. Some reservoirs were supplied with a circular platform or even living quarters for travelers to rest. A striking example can be sardoba in Karaulbazar.

In order to avoid water leaving into the ground, a special solution was used – kyr (in most cases, bentonite clay as an insulator of infiltration from a reservoir of water) when plastering the inner surface. The dome itself could be stepped or smooth, acted as protection from sand and foreign objects entering the water.

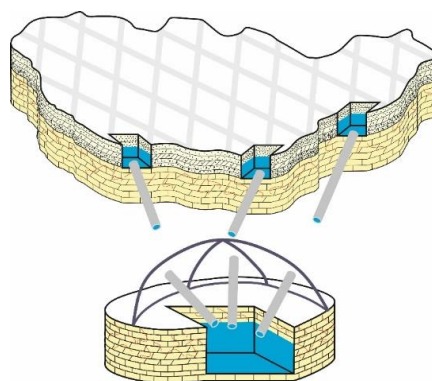


Fig. 2. The scheme of traps on takyr

The word "sardoba" comes from the Persian "sard" – cold and "ob" – water. To this day in Uzbekistan, sardobs – rainwater and meltwater catchments have been preserved in arid zones of Bukhara, Kashkadarya, Navoi, Jizzakh, Syrdarya regions. Sardoba is also available on the territory of Bukhara. Perhaps at the time of its construction it was a suburban area. There are also remnants of sardoba on Ustyurt. For the construction, a complex composition of mortars, waterproofing materials and bricks was used, thanks to which sardobs were preserved. They withstood even highly mineralized groundwater, the level of which rose due to the development of new lands.

Conclusions. The proposed engineering system is capable of collecting water from underground groundwater and transporting it to the main catchment tank or a natural reservoir through irrigation channels of polyethylene pipes. Thanks to this, it is possible to carry out and develop the collection of subsurface groundwater in free water exchange zones in arid climates. Thus, an engineering hydraulic system is being formed, which includes three auxiliary tanks located on the takyr site and remote at various distances from each other. Wells that receive water from the sub-reservoir horizon are combined into a single system using irrigation polyethylene pipes. Consequently, water with the same volume is collected in three containers. From them, it is transported to a certain place, where the volume is three times larger, respectively. Vertical wells laid to a certain depth for ventilation should be equipped along the entire route, which will also condense moisture. Thus, the underground water conduit significantly reduces the evaporation of moisture, as well as the covered arched structure prevents contamination and siltation of the main reservoir.

In this regard, it is advisable to use modern metal structures, which are indispensable elements of the construction of various types of structures. They serve as an integral part of buildings for various purposes – administrative buildings, residential buildings, shopping centers, etc. Structures based on metal arches are ideal for "sardoba" as a prototype or a modern type of ancient sardoba in order to preserve from evaporation and apply sanitary standards for drinking water (Fig.2).

Manufactured arched metal structures have many advantages: relatively light weight; reliability and strength; durability; ease of installation and disassembly. In combination with other modern building materials, these structures provide excellent sound insulation, warmth and have a beautiful appearance. The excellent characteristics of arches made of metal structures allow them to be used for grain storage, industrial premises and civil buildings for various purposes.

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Rezyume: Atmosfera yog'inlarining er usti va er osti oqimining to'planish sharoitlarini o'rganishning asosiy ob'ekti er yuzidan birinchi suvli qatlam bo'lib, ushbu maqola geologik tuzilishini tavsiflaydi. Tektonik nuqtai nazardan, Qoraqalpoq Ustyurtidagi Uru burilish joyi Shimoliy Ustyurt pastligi ichida, Oqtumsuk ko'tarilish zonasi tektonik strukturasining janubiy yonbag'rida, Qoraqidir karst vodiysi yuzasida joylashgan. Bugungi kunga qadar O'zbekistonda sardobi - arid zonlarda yomg'ir va erigan suv havzalari saqlanib qolgan. Shunday qilib, maqola takir uchastkasida joylashgan va bir-biridan turli masofalarda olib tashlangan uchta yordamchi tankni o'z ichiga olgan muhandislik gidravlika tizimini taklif qiladi. Takir gorizonti ostidan suv oladigan quduqlar sug'orish polietilen quvurlari yordamida yagona tizimga birlashtiriladi. Shunday qilib, bir xil hajmdagi suv uchta idishda yig'iladi.

Резюме: Основным объектом изучения условий накопления поверхностного и подземного стока атмосферных осадков является первый от поверхности водоносный горизонт, в данной статье описано геологическое строение. В тектоническом плане Урусский переворот на Каракалпакском Устюрте расположен в пределах Северо-Устюртской впадины на южном склоне тектонической структуры зоны Актумсукского поднятия, на поверхности Каракидырской карстовой долины. До наших дней в Узбекистане сохранились сардобы – водосборы дождевых и талых вод в засушливых зонах. Таким образом, в статье предлагается инженерная гидросистема, включающая в себя три вспомогательных резервуара, расположенных на такырной площадке и удаленных друг от друга на разное расстояние. Колодцы, получающие воду из-под такырного горизонта, объединяют в единую систему с помощью оросительных полиэтиленовых труб. Следовательно, вода одинакового объема набирается в три емкости.

Kalit so'zlar: quduqlar, takirlar, karst vodiysi, pastliklar, yog'ingarchilik, suvli qatlam, sardoba, yer osti suvlarining sun'iy zaxiralari.

Ключевые слова: колодцы, такыры, карстовые долины, котловины, осадки, водоносный горизонт, сардоба, искусственные запасы подземных вод.

UDC 517.9+519.6

ON THE ACCURACY OF DIFFERENCE SCHEMES FOR ONE EVOLUTIONARY INVERSE PROBLEM

Utebaev D., Kazimbetova M.M., Agjanov T.S.
Karakalpak State University named after Berdakh

Summary: *In this paper, we study difference schemes for one ill-posed problem - the inverse problem for the two-dimensional Laplace equation. For an approximate solution to the original problem, an option of the quasi-inversion method is used. First, the approximation is constructed only with respect to the spatial variable. The system of ordinary differential equations, obtained as a result of the approximation of a spatial variable, is solved by finite difference methods of higher accuracy. The questions of approximation, stability and convergence are considered.*

Key words: *inverse problem, quasi-inversion method, finite difference method, approximation, stability, convergence, accuracy*

Introduction. Generally, in direct problems, functions that describe various physical, mechanical, and other phenomena are studied. In this case, the properties of the medium under study (coefficients of equations), as well as the initial states of the process (in non-stationary problems) or its properties at the boundary (in the case of a bounded domain and/or in the stationary case) are assumed to be known. In inverse problems, one of these conditions is often violated. For example, the medium properties are unknown. Sometimes, in inverse problems, the coefficients of equations are required, which characterize important properties of the medium under study, such as density, electrical conductivity, thermal conductivity, etc. The inverse problems are addressed when determining the location, shape, and structure of inclusions, defects, sources (of heat, vibrations, stress, and pollution), etc.

Recently, due to the emergence of powerful computers, a lot of scientific research has been conducted to solve applied inverse or ill-posed problems of mathematical physics. Efficient numerical methods for solving inverse problems were developed. For example, A.N. Tikhonov's regularization methods [1]-[3], J.L. Lions' quasi-inversion method [4], V.K. Ivanov's method [5], M.M. Lavrentiev's method [6] and many other methods (see [7]-[11]). The theoretical aspects of solving inverse ill-posed problems are covered in numerous literature sources (see [12]-[14]).

A large number of scientific articles are devoted to the numerical solution of inverse and ill-posed problems of mathematical physics. In [15], [16], the problems of numerical solutions to various ill-posed problems of mathematical physics were discussed. Various approaches were used to approximate the original differential equation. Particular attention was paid to finite difference methods for solving evolutionary inverse problems. On the basis of the results of the theory of difference schemes, theoretical results on the estimation of the stability and convergence of operator-difference schemes were obtained. Numerous computational experiments on the approximate solution of model problems were conducted.

In [17], a numerical solution to the inverse problem for the nonlinear diffusion-reaction equation was considered. A non-iterative computational algorithm based on the reduction of a differential-difference problem to two direct problems and a linear equation with respect to the desired solution were proposed. In [18], inverse problems of environmental protection were considered, in particular, their numerical solution was studied with various types of atmospheric pollution sources. In [19], numerical methods of higher accuracy were considered for solving inverse problems for parabolic equations.

Recently, much effort has been directed toward the study of inverse problems for high-order Sobolev-type equations. In particular, in [20], a linear equation with unknown coefficients was studied. Results were obtained on the existence and uniqueness of the solution of the inverse

problem for a second-order mathematical model of the Sobolev type. Note that numerical methods for solving inverse problems for high-order Sobolev equations have not yet been sufficiently studied.

Statement of the problem [15]. Consider the two-dimensional Laplace equation

$$\frac{\partial^2 u}{\partial t^2} + \frac{\partial^2 u}{\partial x^2} = f(x, t), \quad (x, t) \in Q_T, \quad (1)$$

with initial conditions

$$u(x, 0) = u_0(x), \quad \frac{\partial u}{\partial t}(x, 0) = 0, \quad x \in \bar{\Omega}, \quad (2)$$

and with boundary conditions

$$u(0, t) = \mu_1(t), \quad u(l, t) = \mu_2(t), \quad t \in (0, T]. \quad (3)$$

Here $Q_T = \{(x, t), x \in \Omega, t \in (0, T)\}$, $\Omega = \{x: 0 < x < l\}$, $\bar{\Omega} = \Omega \cup \Gamma = \{0, l\}$.

Problem (1)-(3) is considered as a Cauchy problem for a second-order differential-operator equation. For the functions set in $\Omega = (0, l)$, we define Hilbert space $H = L_2(\Omega)$ with scalar product (u, g) and norm $\|u\| = \sqrt{(u, u)}$. We define the following operator

$$Au = \frac{\partial^2 u}{\partial t^2}, \quad 0 < x < l. \quad (4)$$

Here operators $A: H \rightarrow H$ and $A = A^* \geq mE$, $m > 0$ hold. Then equation (1) with boundary conditions (3) is written as a differential-operator equation to determine $u(t) \in H$:

$$\frac{d^2 u}{dt^2} - Au = f(t), \quad 0 < t \leq T, \quad (5)$$

with conditions

$$u(0) = u_0, \quad (6)$$

$$\frac{du}{dt}(0) = 0. \quad (7)$$

The ill-posedness of problem (5)-(7) is due to the absence of continuous dependence on the input data (initial conditions).

Construction of difference schemes. Consider an option of constructing control algorithms for the solution based on the perturbation of the original equation (a quasi-inversion method).

To discretize problem (5)-(7), we use the following option of the quasi-inversion method, in which the approximate solution is determined from the equation given in [4], [15]

$$\frac{d^2 u_\alpha}{dt^2} - Au_\alpha + \alpha A \frac{d^2 u_\alpha}{dt^2} = f(t), \quad 0 < t \leq T \quad (8)$$

with initial conditions

$$u_\alpha(0) = u_0^\delta, \quad \|u_0^\delta - u_0\| \leq \delta, \quad (9)$$

$$\frac{du_\alpha}{dt}(0) = 0. \quad (10)$$

Here δ is some positive parameter.

Let us introduce a uniform grid with step h on interval $\bar{\Omega} = [0, l]$

$$\bar{\omega}_h = \{x: x = x_i = ih, i = 0, 1, \dots, N, h = l/N\},$$

where $\omega_h = \{x: x = x_i = ih, i = 1, \dots, N-1, h = l/N\}$ is the set of internal nodes, and $\partial\omega_h = \{x = 0, l\}$ is the set of boundary nodes.

Then, at the internal nodes, the differential operator (4) is approximated by the difference operator

$$\Lambda y = -y_{\bar{x}x}, \quad x \in \omega_h, \quad (11)$$

where $y_{\bar{x}x} = (y(x_i + h) - 2y(x_i) + y(x_i - h)) / h^2$.

In the grid space H_h , we introduce the following scalar product and norm:

$$(y, \vartheta) = \sum_{x \in \omega} y(x) \vartheta(x) h, \quad \|y\| = (y, y)^{1/2}.$$

On the set of functions vanishing on $\partial\omega_h$, the following estimate is valid

$$\Lambda = \Lambda^* \geq \lambda_0 E, \quad \text{where } \lambda_0 = \frac{4}{h^2} \sin^2 \frac{\pi h}{2l} \geq \frac{8}{l^2} \quad [21].$$

After approximation in space, problem (8)-(10) is assigned the following problem (a system of second-order ordinary differential equations)

$$D \frac{d^2 u_{\alpha,h}}{dt^2} - \bar{A} u_{\alpha,h} = f_h(t), \quad 0 < t \leq T, \quad (12)$$

$$u_{\alpha,h}(0) = u_0^\delta, \quad \|u_0^\delta - u_0\| \leq \delta, \quad (13)$$

$$\frac{du_{\alpha,h}}{dt}(0) = 0, \quad (14)$$

where $D = E + \alpha A$, $\bar{A} = -\Lambda$, $u_{\alpha,h} \in H_h$.

As is known, the spatial approximation of operator A (11) has a second-order approximation error, i.e. $(\Lambda u)_i - (Au)_i = O(h^2)$.

Now problem (12) - (14) is solved by the method of finite differences. We introduce a uniform time grid t with step τ on interval $t \in [0, T]$ $\bar{\omega}_\tau = \{t_n = n\tau, n = 0, 1, \dots, M, \tau = T / M\}$, where $\omega_\tau = \{t_n = n\tau, n = 1, \dots, M, \tau = T / M\}$.

Problem (12) – (14) is approximated by an explicit three-layer difference scheme of the second-order approximation [21], [22]:

$$(E - \alpha \bar{A}) y_{\bar{t}t} + \bar{A} y = \varphi, \quad y_0 = u_0, \quad y_1 = y_0 + \tau \tilde{u}_0, \quad (15)$$

$$\tilde{u}_0(x) = \bar{u}_0(x) + 0.5\tau(\partial^2 u_0 / \partial x^2 + f(x, 0)), \quad x \in \bar{\omega}_h,$$

where $y = y^n = y(t_n)$ approximates $u_{\alpha,h}$, $t_n \in \omega_\tau$, $\varphi = \phi^n$ approximates $f(t)$, $y_{\bar{t}t} = (y^{n+1} - 2y^n + y^{n-1}) / \tau^2$. It can be seen from the formula that

$$\tilde{u}_0(x) - u_t(x, 0) = O(\tau^2). \quad (16)$$

Scheme (15) can be written in the canonical form of three-layer operator-difference schemes

$$B y_t + R y_{\bar{t}t} + \bar{A} y = \varphi, \quad y_0 = u_0, \quad y_1 = y_0 + \tau \tilde{u}_0 \quad (17)$$

with operators

$$B = 0, \quad R = (E - \alpha \bar{A}), \quad \bar{A} = -\Lambda. \quad (18)$$

Here $y_t = (\hat{y} - \check{y}) / (2\tau)$, where $\hat{y} = y^{n+1}$, $\check{y} = y^{n-1}$.

It was proven in [22] (see Theorem 7.19), that difference scheme (15) is ρ -stable (uniformly stable) for $\rho = \exp\{\tau / \sqrt{\alpha}\}$, i.e., the following estimate holds

$$\|y_{n+1}\| \leq \rho \|y_n\|, \quad t_n \in \omega_h. \quad (19)$$

As is known, if a linear difference scheme is uniformly stable with respect to the initial data, then it is also stable with respect to the right-hand side [21]. Approximation and stability imply the convergence of scheme (17) of $O(\tau^2 + h^2)$ order.

Now, instead of scheme (15), consider the following scheme with weights

$$(E - \alpha \bar{A})y_{\bar{t}} + \bar{A}y^{(\sigma, \sigma)} = \varphi, \quad y_0 = u_0, \quad y_1 = y_0 + \tau \tilde{u}_0, \quad (20)$$

where $y^{(\sigma, \sigma)} = \sigma \hat{y} + (1 - 2\sigma)y + \sigma \check{y}$.

Scheme (20) has the canonical form (17) with operators

$$B = 0, \quad R = E - \alpha \bar{A} + 0.5\tau \bar{A}, \quad \bar{A} = -\Lambda.$$

Stability conditions

$$B \geq 0, \quad R \geq \frac{1+\varepsilon}{4} \tau^2 \bar{A}$$

are fulfilled subject to

$$\sigma \geq \frac{1+\varepsilon}{4} + \frac{1}{\tau^2} \left(\alpha - \frac{1}{\|\bar{A}\|} \right). \quad (21)$$

Then, based on Theorem 4.24 in [18, p. 138], the following assertion holds.

Theorem 1. When condition (21) is satisfied, the following a priori estimate holds to solve the difference scheme (20)

$$\|y_{n+1}\|_{\bar{A}} \leq M_1 \sqrt{\frac{1+\varepsilon}{\varepsilon}} \left(\|y_0\|_{\bar{A}} + \|y_1\|_{E-(\alpha-0.5\tau^2\sigma)\bar{A}} + \sum_{k=1}^n \tau \|\varphi_k\| \right). \quad (22)$$

For $\sigma = 0$, we obtain an explicit scheme (15), and for $\sigma = 0.5$ - an implicit absolutely stable scheme.

It follows from inequality (21) that under the following condition

$$\tau \leq 2h \sqrt{\frac{1-c_2\alpha/h^2}{(1+\varepsilon)c_2}}, \quad \alpha < \frac{h^2}{c_2},$$

the explicit difference scheme $\sigma = 0$ is stable with respect to the initial data and the right-hand side in Hilbert space $H_{\bar{A}}$, and the a priori estimate (22) is valid for its solution.

Approximation error and convergence. Determine the approximation errors of scheme (20). Substituting error $z = y - u$, i.e. $y = z + u$ into (20), we obtain the problem for the error

$$(E - \alpha \bar{A})z_{\bar{t}} + \bar{A}z^{(\sigma, \sigma)} = \psi, \quad (23)$$

$$z_0 = 0, \quad z_1 = \vartheta, \quad (24)$$

where

$$\psi_i^n = \varphi - (E - \alpha \bar{A})u_{\bar{t}} - \bar{A}u^{(\sigma, \sigma)}, \quad \vartheta_i = \tilde{u}_0(x_i) - u_t(x_i, 0), \quad i = 1, 2, \dots, N-1$$

are the approximation errors of the difference scheme (20) and the second initial condition in the solution to the differential problem (12)-(14). Let there exist necessary bounded derivatives with respect to variables x and t . Then, taking into account (16) and the following relations

$$\mathcal{G}^{(\sigma, \sigma)} = \mathcal{G} + \sigma \tau^2 \mathcal{G}_{\bar{t}}, \quad u_{\bar{t}, i} = \frac{\partial^2 u(x_i, t_n)}{\partial t^2} + O(\tau^2), \quad \Lambda u_i = (Au)_i^n + O(h^2),$$

we get the following inequalities

$$\sum_{k=1}^n \tau \|\psi_k\| \leq t_n l^{1/2} \max_{1 \leq i \leq N-1} |\psi_i| \leq c(h^2 + \tau^2), \quad (25)$$

$$\|z_{t,0}\|_{E-(\alpha-0.5\sigma\tau^2)\bar{A}} \leq c(h^2 + \tau^2), \quad (26)$$

where $c - const$, independent on h and τ .

Next, to solve problem (23), (24), using a priori estimate (22), we find

$$\max_{t \in \omega_\tau} \|z(t)\|_{\bar{A}} \leq M_1 \sqrt{\frac{1+\varepsilon}{\varepsilon}} \left(\|z_{t,0}\|_{E-(\alpha-0.5\sigma\tau^2)\bar{A}} + \sum_{k=1}^n \tau \|\psi_k\| \right).$$

Substituting estimates (25), (26), we make sure that the difference scheme with weights (20) converges to the solution of the original problem (12)-(14) at a rate of $O(h^2 + \tau^2)$, i.e. to solve problem (23), (24) we have the following estimate

$$\max_{t \in \omega_\tau} \|z(t)\|_{\bar{A}} = \max_{t \in \omega_\tau} \|y(t) - u(t)\|_{\bar{A}} \leq O(h^2 + \tau^2).$$

Thus, the following theorem was proven.

Theorem 2. Let condition (22) be satisfied. Then the solution to scheme (20) converges to a smooth solution of the original problem (12)-(14) at a rate of $O(h^2 + \tau^2)$, i.e. the following accuracy estimate holds

$$\|y(t) - u(t)\|_{\bar{A}} \leq O(h^2 + \tau^2).$$

Scheme of higher accuracy. Based on difference scheme (15), we can construct the following difference scheme

$$\tilde{D}y_{\bar{t}} + \bar{A}y = \phi, \quad (27)$$

$$\text{where } \tilde{D} = E - \alpha \bar{A} + \frac{\tau^2}{12} \bar{A}, \quad \phi = f + \frac{\tau^2}{12} f_{\bar{t}}.$$

The initial conditions are approximated as follows:

$$y_0 = u_0, \quad y_1 = y_{t,0} = \bar{y}_1, \quad (28)$$

$$\text{where } \bar{y}_1 = \left[E - \left(\alpha + \frac{\tau^2}{6} \right) \bar{A} y_1 + \frac{\tau^2}{6} \frac{df}{dt} \right].$$

Difference scheme (27), (28) approximates problem (12)-(14) of $O(\tau^4)$ order if $u(t) \in C^6[0, T]$, $f(t) \in C^4[0, T]$.

Scheme (27) has the canonical form (17) with the following operators

$$B = 0, \quad R = E - \alpha \bar{A} + \frac{\tau^2}{12} \bar{A}, \quad \bar{A} = -\Lambda, \quad \phi = \varphi.$$

Therefore, based on Theorem 7.19 given in [15], the difference scheme (27), (28) is ρ -stable (uniformly stable) with $\rho = \exp\{\tau / \sqrt{\alpha}\}$, i.e. estimate (19) holds.

Now consider the scheme with weights

$$\tilde{D}y_{\bar{t}} + \bar{A}y^{(\sigma_1, \sigma_2)} = \varphi, \quad y_0 = u_0, \quad y_1 = \bar{y}_1, \quad (29)$$

where $y^{(\sigma_1, \sigma_2)} = \sigma_1 \hat{y} + (1 - \sigma_1 - \sigma_2)y + \sigma_2 \check{y}$, $\hat{y} = y(t_{n+1})$, $\check{y} = y(t_{n-1})$, $\sigma_1 \geq 0$, $\sigma_2 \geq 0$.

Substituting the following identity

$$y^{(\sigma_1, \sigma_2)} = y + \tau(\sigma_1 - \sigma_2)y_i + (\tau^2 / 2)(\sigma_1 + \sigma_2)y_{\bar{t}},$$

into (29), we obtain

$$\left(E - \left[\alpha - \frac{\tau^2}{12} - \frac{\tau^2}{2}(\sigma_1 + \sigma_2) \right] \bar{A} \right) y_{\bar{t}} + \tau(\sigma_1 - \sigma_2)\bar{A}y_i + \bar{A}y = \varphi,$$

i.e., we have the canonical form (17) of scheme (29), where

$$R = E - \left[\alpha - \frac{\tau^2}{12} - \frac{\tau^2}{2}(\sigma_1 + \sigma_2) \right] \bar{A}, \quad B = \tau(\sigma_1 - \sigma_2)\bar{A}, \quad \bar{A} = -\Lambda.$$

For $\sigma_1 = \sigma_2 = 0$, we obtain the explicit scheme (15), and for $\sigma_1 = \sigma_2 = \sigma$, we obtain the symmetric scheme (20).

Since, by conditions $A^* = A > 0$, $D^* = D > 0$, then $\bar{A} = \bar{A}^* > 0$, $R = R^* > 0$, $B = B^* \geq 0$,

if $\sigma_1 - \sigma_2 \geq 0$ and $\alpha > \frac{\tau^2}{12} + \frac{\tau^2}{2}(\sigma_1 + \sigma_2)$.

The stability conditions are met under the following condition

$$\sigma_1 \geq \sigma_2, \quad \alpha > \frac{\tau^2}{6} + \frac{\tau^2}{2}(\sigma_1 + \sigma_2). \quad (30)$$

Note that $\tilde{D} = \tilde{D}^* > 0$, if $\alpha \geq \tau^2/12$ and for $\sigma_1 + \sigma_2 \geq 0$ and $\tilde{D}^{-1} \leq E$ then, based on the results given in [21], [22], we have the following.

Theorem 2. Let the operators be $A^* = A > 0$, $D^* = D > 0$ and conditions (30) be met. Then, to solve problem (29), we have the following a priori estimate

$$\|y^{n+1}\|_{\bar{A}} \leq \sqrt{\frac{1+\varepsilon}{\varepsilon}} \left(\|y(0)\|_{\bar{A}} + \|y_t(0)\|_{\bar{D}} + \sum_{s=1}^n \tau \|\phi^s\| \right),$$

or

$$\|y^{n+1}\|_{\bar{D}} \leq \sqrt{\frac{1+\varepsilon}{\varepsilon}} \left(\|y_0\|_{\bar{D}} + \|Dy_1\|_{\bar{A}^{-1}} + \sum_{s=1}^n \tau \|\phi^s\|_{\bar{A}^{-1}} \right). \quad (33)$$

Based on estimate (33), we obtain the following result.

Theorem 3. Let the operators be $A^* = A > 0$, $D^* = D > 0$ and conditions (30) be met. Then the solution to scheme (29) converges to a smooth solution of the original problem (12)-(14) at a rate of $O(h^2 + \tau^4)$, i.e. the following accuracy estimate holds

$$\|y(t) - u(t)\|_{\bar{D}} \leq O(h^2 + \tau^4).$$

Conclusions. Difference schemes with weights of the second-order accuracy in space and the fourth-order accuracy in time were constructed for one nonstationary inverse problem. Stability conditions and a priori estimates in energy norms were obtained, and on their basis, accuracy estimates for the constructed schemes in the class of smooth solutions were proven. The results obtained could be used for numerical simulation of various evolutionary inverse problems, including inverse problems for high-order Sobolev-type equations.

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Rezyume: *Ishda bitta teskari masala uchun ayirmali sxemalarini tadqiq qilish masalasi amalga oshiriladi – ikki o'lchovli Laplas tenglamasi uchun teskari masala. Dastlabki muammoni taxminiy hal qilish uchun kvaziobrashcheniya usulining versiyasi qo'llaniladi. Avval faqat fazoviy o'zgaruvchi buyicha approximatsiya amalga oshiriladi. Fazoviy o'zgaruvchining approximatsiyasi natijasida olingan oddiy differentsial tenglamalar sistemasi yuqori aniqlikdagi chekli ayirmalar usuli asosida echiladi. Masalada approximatsiya, turgunlik va yaqinlashish masalalari ko'rib chiqilgan.*

Резюме: *В работе проводится исследование разностных схем для одной некорректной задачи – обратная задача для двумерного уравнения Лапласа. Для приближенного решения исходной задачи используется вариант метода квазиобращения. Сперва аппроксимация проводится только по пространственной переменной. Система обыкновенных дифференциальных уравнений, полученная в результате аппроксимации пространственной переменной, решается методом конечных разностей повышенной точности. Рассмотрены вопросы аппроксимации, устойчивости и сходимости.*

Kalit so'zlar: *teskari masala, kvaziobrasheniye usuli, chekli ayirma usuli, approksimasiyasi, barqarorlik, yaqinlik, aniqlik.*

Ключевые слова: *обратная задача, метод квазиобращения, метод конечных разностей, аппроксимация, устойчивость, сходимость, точность.*

**HYDROGEOLOGICAL STUDIES OF UNDERGROUND WATERS OF THE KARAKALPAK
USTYURT**

Kholzhigitov Sh.B.¹, Dzhaksymuratov K.M.², Toshev Sh.D.³

¹*Tashkent State Technical University named after Islam Karimov,*

²*Research and Innovation of the Nukus Mining Institute at the Navoi State Mining and
Technological University,*

³*State Establishment "Institute of Hydrogeology and Engineering Geology".*

Summary: *In the article, the authors consider the vast territory of the Karakalpak Ustyurt. For the timely and complete development and development of large-scale industrial facilities of the territory of Ustyurt, a large amount of both drinking and industrial water is required. As is known, there are no local open reservoirs suitable for water supply, irrigation and oasis irrigation in this territory. In this regard, the urgency of the problem lies in a comprehensive study followed by the identification and comprehensive assessment of regional resources of poorly mineralized groundwater. The distribution of groundwater mineralization both in depth and in space from north to south increases the mineralization values. In the studied area, in the direction of groundwater movement, mineralization varies from 7-10 g/l and elevated parts of the territory to 25 g/l or more. These conditions are violated when the territory consists of a flat, low relief. The mineralization of groundwater in wells and wells of these territories is 0.5-1 g/l. They are associated with the lenses of fresh water formed as a result of the intake of takyr runoff and precipitation.*

Key words: *oil and gas fields, groundwater, mineralization, Ustyurt plateau, hydrogeological studies, water-bearing rocks, Barsakelmessky trough, active water exchange zone, groundwater lenses.*

Introduction. Currently, with the discovery of oil, gas and other solid minerals (iron, manganese, copper, etc.), as well as highly mineralized therapeutic mineral and thermal waters, Ustyurt has become one of the important industrial regions of the Republic of Uzbekistan. The prospects for the above-mentioned minerals of the Ustyurt plateau, the geological and structural position largely converges with the conditions of Mangishlak. Geological and hydrogeological studies of deposits

Ustyurt was accompanied by a dramatic increase in the pace of geological, geophysical and hydrogeological surveys and the implementation of a large volume of prospecting and mapping, structural, operational-exploration and special hydrogeological drilling. The results obtained will make it possible to clearly visualize the structure of the Ustyurt plateau and assess the prospects for the use of its riches, including the underground waters of the territories of modern water exchange.

The prospects for the development of the Ustyurt plateau and its eastern part are currently determined on the one hand by the development of animal husbandry, on the other by the extensive construction of industrial oil and gas processing and the development of therapeutic thermal and mineral groundwater.

Thus, for the timely and complete development and development of large-scale industrial facilities of the vast territory of Ustyurt, a large amount of both drinking and industrial water is required. As it is known, there are no local open reservoirs suitable for water supply, irrigation and oasis irrigation in the research area. In addition, the remoteness of the studied territory from large river resources, the task of a comprehensive study with subsequent identification and comprehensive assessment of regional resources of poorly mineralized groundwater for its subsequent use is an urgent problem.

The study area of the research. Distinguished by its peculiar geological and tectonic structure, peculiar relief forms, the presence of deep drainless depressions and other natural oasis, it has attracted the attention of researchers since ancient times. As is known from historical data on geography, the first land description of the territory of the Ustyurt plateau was compiled by

Claudius Ptolemy in the second century. And information about the underground waters of the area was received much later.

A major turning point in the study of the Ustyurt plateau occurred in the 1950-60 years. In these years, a number of important generalized studies were conducted and published in the Karakalpak part of Ustyurt, including hydrogeological conditions in the monographs of G.N.Kamensky, M.M.Tolstikhin and I.N.Tolstikhin "Hydrogeology of the USSR" (1959). And the analytical description of O.K.Lange "Underground waters of the USSR" (1963).

Major hydrogeological studies accompanied by a large volume of exploration, experimental and applied research such as (1977-79. A.V. Pakhomova, N.I. Bykov, Sh.K. Nabiev) State hydrogeological survey on a scale of 1:200,000, (1978-81 by T.N. Dzhumamuratov), repeated State hydrogeological survey on a scale of 1:200,000 covering more extensive territories with the inclusion of Southern Ustyurt. And also (2014-18) N.P. Samenderov, T.B. Allaniyazov) regional hydrogeological study within the Central Ustyurt Artesian basin in order to assess the forecast groundwater resources of Neogene and Cretaceous sediments.

Based on the results of the above sources and personal research, an assessment of the role of groundwater in the development of Ustyurt and modern hydrogeological studies is carried out.

Discussion of the results. According to the geological structure, aquiferous series of Cretaceous deposits have been identified, which have become widespread throughout the study area. In the hydrogeological conditions of the Cretaceous deposits, one of the most powerful aquifer series in the territory of the Karakalpak Ustyurt has been identified. Studies have identified two series of Cretaceous deposits: Neocom-Aptian and Albaturonian [1,2].

The water-bearing rocks of the Neocom-Aptian aquifer complex are widely distributed in the study area. Depending on the structural position of the sections, the roof of the aquifer complex is opened at various depths. In the consolidated parts of the structures of the Central Ustyurt uplift system, the water-bearing rocks of the complex lie under the Albian and Neogene formations at a depth of 230-250 m. In the Severo-Ustyurt depression, the Barsakelmessky trough, the Shakhpakhtinsky stage and the Assakeaudan trough, they are opened at a depth of 1400-1700 to 1620-1990 m. Also, within the Aktumsuk uplift zone, they were uncovered at a depth of 970-1000 m. Within these limits, the capacity of the aquifer complex, depending on the number and capacity of collectors, varies from 180-195 m (Barsakelmas and Assakeaudan bends) to 295-410 m with a total capacity of the complex from 460-640 m [1,2]. Despite the fact that the porosity of the water-bearing rocks ranges from 12 to 32%, low flow rates of up to 0.4-0.7 l/sec were obtained from wells. On the structures confined to the Aktumsuk zone, there is a deterioration in the reservoir properties of water-bearing rocks and a decrease in water availability. And also the highest position of the piezometric position of the underground waters of the complex is located in the deeply lowered part of the Barsakelmas trough, and a little lower, in the south-east of the Assakeaudan trough, in the places of its closure and confluence with the Amudarya depression.

In general, groundwater is highly concentrated brines. Their lowest mineralization is noted in the Central Ustyurt zone, where it is 26-45 g/l, the Barsakelmas trough is 167-198 g/l. Analogical mineralization of groundwater is observed on the territory of the North-Ustyurt and South-Ustyurt bends.

Of the salts in the composition of the waters, sodium chlorides predominate. The chlorine content is 115-121, and sodium 55-65g/l. The waters are slightly sulphate, the sulphate coefficient ranges from 0.23-2.0. They are mostly sodium chloride waters. And the content of micro-components increases with increasing mineralization of reservoir waters and amounts to: iodine from 2-4 to 18 mg/l, bromine to 462-543 mg/l, boron from 10-14 to 76-80 mg/l. It should be noted that in the most submerged parts of Ustyurt, the waters of the complex have a temperature reaching up to 100-109°C (Alambek). And the areas with the lowest immersion of the layers of the complex are characterized by a water temperature of 44-73°C.

The aquiferous complex of the Albaturonian sediments corresponds to a new transgressive sedimentation cycle and is ubiquitous in the Karakalpak Ustyurt. According to the literature sources

[1,2], it is established that both Albian and Cenomanian and Turonian deposits are identified as aquifers. This situation is not observed within the Central Ustyurt uplift system, where the upper layers of the section of the aquifer complex are either eroded (Karabaur uplift), or under the conditions of occurrence are drained in the Aibugir area [1,2]. The formation waters of the complex in the above-mentioned areas are highly metamorphosed (sodium chloride coefficient 0.75-0.8), sulfate-free, rarely weakly sulfate, sodium chloride. They contain trace elements: iodine up to 15 mg / l, bromine 208-547 mg / l, with a temperature up to 71°C.

Deposits of the Neogene and Quaternary systems are very widespread on the territory of the Karakalpak Ustyurt. The water-bearing rocks of these sediments differ sharply from the aquifers of the underlying sediments. These are unchanged and not dislocated rocks lying almost horizontally on a powerful Paleogene-Lower Miocene water barrier. Forming the uppermost part of the hydrogeological section. In the studied area, groundwater is under the direct influence of climatic factors, i.e. the area of active water exchange and differ from the underlying ones not only by their qualitative and quantitative characteristics, but also by the conditions of formation.

The conditions of accumulation of the aquifer complex occurred in various facies conditions with repeated alternation of transgressions of regressions of the sea. The various conditions of sedimentation, which caused the diversity in the lithological composition of rocks, determined their hydrogeological heterogeneity both in the vertical section and in the area of development.

In most of the studied territory of the described aquifer complex, the sole is the marl-clay strata of the Paleogene and only in structurally elevated areas of the territory of the Upper Cretaceous marl. The thickness of these deposits varies from 18-22 to 56-60 m, an increase is observed in the direction of the general immersion of the formation. In connection with this, the Miocene strata and the location of the drains change the direction of movement of groundwater (Fig. 2). In the north of the plateau, their movement occurs to the northwest of the Aktumsuk shaft towards the Samsky salt marshes and chinks of the plateau, in the central part the underground flow is directed to the Barsakelmess basin, in the south from the Central Ustyurt uplift zone to the Assakeaudan depression, in the east to the Sarykamysh (Fig.2). The slopes of the surface of the aquifer complex in most of the studied area they are insignificant and amount to 0.001-0.005, while the consolidated part of the Central Ustyurt zone increases to 0.05.

In general, this circumstance, i.e. the deep occurrence of groundwater, mainly the marl composition and moderate plastering of water-bearing rocks and, as a consequence, the deterioration of the conditions of the feeding area, and their circulation caused increased and high mineralization of groundwater in almost the entire territory of the Karakalpak Ustyurt. Thus, the lowest mineralization of groundwater from 2.3-6.3 to 7.6-12.1 g/l was detected in the territories of the most elevated plateaus (Central Ustyurt, Aktumsuk uplift zones).

The value of total mineralization in these areas ranges from 2.3 to 12.1 g/l. Further in the direction of movement, there is a rapid increase in mineralization and in most of the deflection, the mineralization of the waters of the complex is 15-20 g / l, and in the southern half reaches 30-35 g / l, and in the central areas of the studied territory of the Assakeaudan depression and the Sarakamysh basin, its values often reach up to 100-110 g / l. According to the mineralization values of the underground waters of the complex, there is a noticeable increase in them with depth. In the near-consolidated part of the Central Ustyurt zone at a depth of 20 -25 m, mineralization is 3-2 – 6 g/l, at a depth of 55 m, its increase is observed to 9.3-10.0 g/l, at a depth range of 83-113 m, an increase was noted from 10.8 to 25 g/l and at an interval of 101-135 m reaches 21-33 g/l [2-7].

Less mineralized groundwater (3-9 g/l), common in the research areas in the areas of runoff formation, has a sulfate or chloride-sulfate sodium composition. The content of sulfates ranges from 52-75%. eq, chlorine 20-46%. eq and the content of alkalis reaches up to 60%. eq. With an increase in mineralization by more than 10 g / l, the concentration of chlorine increases to 70%. eq, and the sulfate ion moves to the second place. In such cases, sodium cations with a concentration of up to 75-80%. eq comes in first place.

The water content of the deposits of the complex varies in different areas of the research area. According to the results of pumping wells, the costs vary very widely: from tenths and even hundredths of a liter per second with a decrease in the groundwater level by 7-12 m, and, accordingly, with a flow rate of 10-14 l / sec, the decrease is 2-5 m. For these deposits, the filtration coefficient, according to trial pumping data, varies from 1.5-1.9 to 50-90 m /day, while for marls from 0.8 to 9 m / day.

Conclusion. Thus, less mineralized waters are confined to surface sediments compared to waters of deeper sediments. But they are also characterized by a diversity of mineralization and chemical composition. Fresh and slightly saline groundwater with mineralization up to 3 g/l is usually confined to the arches of anticline uplifts with relatively higher elevations, to the causal drained strip of the northern and northwestern parts of the Ustyurt plateau. In the Severo-Ustyurt depression, the groundwater is brackish with mineralization from 3-5 to 10 g/l. Where the increase in mineralization is associated with the wings of the depression to its central part [3-6].

Considering the distribution of groundwater mineralization both in depth and in space, there is a decrease in the amount of precipitation from north to south, in the same direction, the values of mineralization increase. In the studied area, in the direction of groundwater movement, mineralization varies from 7-10 g/l and elevated parts of the territory to 25 g/l or more. At the same time, the change of groundwater of various mineralization occurs abruptly, at short distances, unlike the northern half, where the growth of mineralization is gradual.

The above conditions are violated in those areas where flat, low relief is common. In the wells and wells of these territories, the mineralization of groundwater is 0.5-1 g/l. They are associated with the lenses of fresh water formed as a result of the intake of takyr runoff and precipitation.

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Rezyume: Maqolada mualliflar Qoraqalpoq Ustyurtining bepoyon hududini ko'rib chiqadilar. Ustyurt xududidagi yirik sanoat ob'ektlarini o'z vaqtida va to'liq o'zlashtirish va o'zlashtirish uchun ko'p miqdorda ichimlik suvi va sanoat suvi talab qilinadi. Ma'lumki, bu hududda suv ta'minoti, sug'orish va vohani sug'orish uchun yaroqli mahalliy ochiq suv omborlari mavjud emas. Shu nuqtai nazardan, muammoning dolzarbligi har tomonlama o'rganishdan so'ng, mineralizatsiyalanmagan er osti suvlarining mintaqaviy resurslarini aniqlash va har tomonlama baholashdan iborat. Er osti suvlari minerallashuvining chuqurlikda ham, fazoda ham shimoldan janubga tarqalishi minerallashuv qiymatlarini oshiradi. O'rganilayotgan hududda yer osti suvlari

harakati yo'nalishi bo'yicha minerallashuv 7-10 g/l va hududning baland qismlarida 25 g/l va undan ko'progacha o'zgarib turadi. Hudud tekis, past relefdan iborat bo'lsa, bu shartlar buziladi. Bu hududlarning quduqlari va quduqlarida er osti suvlarining minerallashuvi 0,5-1 g/l ni tashkil qiladi. Ular takir oqimi va yog'ingarchilikni qabul qilish natijasida hosil bo'lgan toza suvning linzalari bilan bog'liq.

Резюме: В статье авторы рассматривают обширную территорию Каракалпакского Устюрта. Для своевременного и полного освоения и освоения крупных промышленных объектов территории Устюрта требуется большое количество как питьевой, так и технической воды. Как известно, на данной территории отсутствуют локальные открытые водоемы, пригодные для водоснабжения, орошения и оазисного орошения. В связи с этим актуальность проблемы заключается в комплексном изучении с последующим выявлением и комплексной оценкой региональных ресурсов слабоминерализованных подземных вод. Распределение минерализации подземных вод как по глубине, так и в пространстве с севера на юг увеличивает значения минерализации. На изучаемом участке в направлении движения подземных вод минерализация изменяется от 7-10 г/л и на возвышенных участках территории до 25 г/л и более. Эти условия нарушаются, когда территория состоит из плоского, низкого рельефа. Минерализация подземных вод в колодцах и колодцах этих территорий составляет 0,5-1 г/л. Они связаны с линзами пресных вод, образовавшимися в результате поступления такырного стока и атмосферных осадков.

Kalit so'zlar: *neft va gaz konlari, yer osti suvlari, minerallashuv, Ustyurt platosi, gidrogeologik tadqiqotlar, suvli jinslar, Barsakelmes chuqurligi, faol suv almashinuvi zonasi, yer osti suvlari linzalari.*

Ключевые слова: *месторождения нефти и газа, подземные воды, минерализация, плато Устюрт, гидрогеологические исследования, водоносные породы, Барсакельмесский прогиб, зона активного водообмена, линзы подземных вод.*

XYLOPHAGE-INSECTS OF NATURAL BIOTOPES OF THE SOUTH ARAL SEA

Zhuginisov T.¹, Alimbetov A.¹, Tajetdinov M.¹, Khalilaeva B.¹, Ruzimatova F.², Kubaev J.¹,

¹ *Karakalpak State University named after Berdakh,*

² *Urgench State University.*

Summary: *This article says that one of the main reasons for the reproduction of xylophagous insects is the fact that a large part of the natural biotope of the Southern Aral Sea is found in sandy-desert areas, which is an exceptional place for the development of pests. Also, in the natural biotope, the issues of studying the taxonomic unity of insects, zaraquna features and monitoring levels of their distribution are covered.*

Key words: *South Aral sea, territory, forests, historical objects, species, ecological problems.*

INTRODUCTION

The global climate change occurring in the world, human development of natural ecosystems and the development of urbanization lead to the adaptation of entomofauna representatives to anthropogenically developed areas and the increase in the extent of their damage. Especially in the ecosystem of natural groves and developed areas, the increase in the scale of xylophage-insects causes serious damage to wood-building materials.

The first information about xylophage-insects in Central Asia is related to the 1856-1857 world famous traveler Pyotr Petrovich Semenov, who collected about 700 species of insects during his trip to the Tien-Shan mountains. In addition, from the middle of the 20th century, xylophage-insect species were recorded by [1]. In particular, in the natural orchards of the Kyrgyz Republic,

full information on the prevalence of xylophage-insect species *Aeolesthes sarta* (Sols.), *Hyleborussaxeseni* (Ratz.), *Carphoborus kueschkensis* (Socan.) was mentioned, that is, a complete analysis was made of the urban mustache, which is the main dominant among these species. It was mentioned that the homeland of the city mustache is Pakistan and Afghanistan, and it is widely distributed in the southern regions of the Central Asian Republics of Uzbekistan, Kyrgyzstan, Kazakhstan, Tajikistan and Turkmenistan.

In the world, the ongoing global climate change, the development of natural ecosystems by mankind and the development of urbanization lead to the adaptation of representatives of the entomofauna, to the anthropogenic territories they have developed and to an increase in their harm. Especially, the increase in the number of xylophagous insects in the ecosystems of tugai and developed territories causes serious damage to building materials made of wood. In this regard, the determination of the species diversity of xylophagous insects in anthropogenically transformed territories, the assessment of the damage they cause to tugai, settlements, administrative buildings, cultural and strategic objects, and the improvement of methods of combating them are of great scientific and practical importance [1; 2; 4].

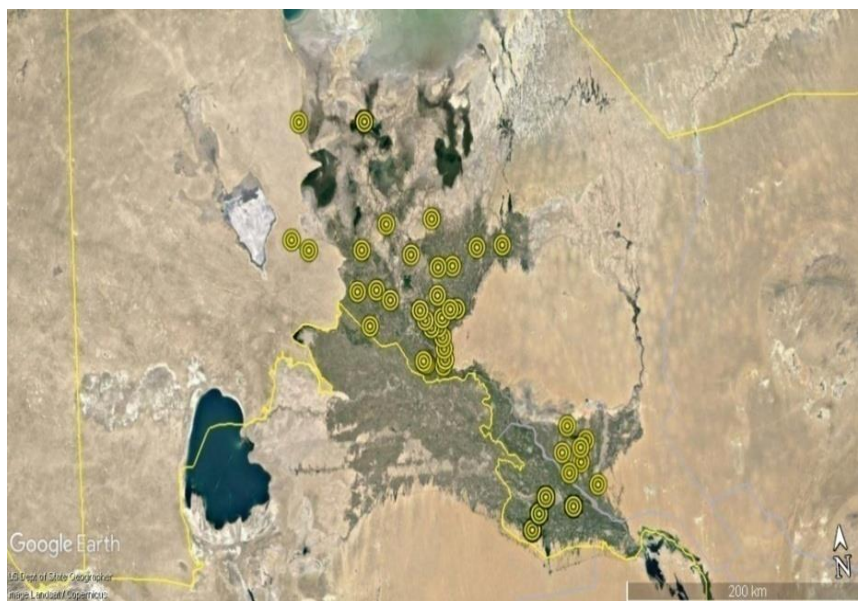
In the world, special attention is paid to the protection and preservation of the integrity of historically formed and reflecting civilization, as well as the culture of mankind, cultural and historical objects consisting of wooden structures from the harmful effects of biological organisms. In this respect, xylophagous insects are of particular importance.

They are extremely adapted to the natural and developed environmental conditions, the high intensity of reproduction, adaptability to pesticides lead to serious consequences not only of historical and cultural sites, but also of settlements. Especially, representatives of xylophagous insects, widespread in the arid territories of Central Asia, such as: Hymenoptera (Linnaeus, 1758) - *Xylocopa valga*, Coleoptera (Linnaeus, 1758) - *Buprestis rustica*, *Hylotrupes bajulus*, *Anobium pertinax*, Isoptera, 1832) - *Anacanthotermes ahngerianus*, *A.turkestanicus* harm mainly wooden materials that are stored for a long time, bringing them to the state of sawdust (husk), their activity is especially dangerous for all wooden parts of buildings and structures, wooden products, furniture and museum exhibits. It should be noted that the location of cultural and historical objects in natural

ecosystems, including tugai landscapes, especially suitable for the development of xylophagous insects, has a multifaceted negative impact on ecosystems and requires the development of measures to combat xylophagous insects. Therefore, the inventory of xylophagous insects widespread in tugai landscapes, anthropogenically transformed territories, the identification of harmful dominant species and the development of improved measures to combat them are of great scientific and practical importance.

MATERIALS AND METHODS

The collection and research of materials was carried out during 2017-2022. To establish the fauna and the distribution of xylophagous insects on the territory of the Southern Aral Sea region, the work on collecting material was carried out along the selected routes (1).



A map of coordinates where xylophagous insects were collected on natural ecosystems and anthropogenically transformed territories of the Southern Aral Sea region (Google Earth)

RESULTS AND DISCUSSION

On the territory of Uzbekistan there are desert, mountain and foothill areas, as well as tugai on the banks of rivers, and pests feeding on trees have practically not been studied. Biomaterial was collected on the territory of the Southern Priaralye: the NizhneAmudarya State Biosphere Reserve, the ecosystem of the tugays of the Muinak region, and attention was paid to the habitats of xylophagous insects, their species, harmful activity, and distribution in tugai ecosystems.

Having studied the fauna and taxonomic units of xylophagous insects on the territory of the Southern Aral Sea region, out of 36 species of 36 genera of 23 families of 8 orders, 31 forest farms of the Southern Archipelago region, and 36 species in natural biotopes.

In the south of the Republic of Karakalpakstan - Beruniy, Tortkul and Ellikkala districts, very rare species of xylophagous insects were identified. Isoptera of xylophagous insects (Brullé, 1832), Hodotermitidae, Anacanthotermes ahngerianus, A. turkestanicus; Hymenoptera (Linnaeus, 1758), Formicidae, Camponotus lameerei were found in excess and were recorded as swarm-forming species (Table 1)

Table 1

Meeting situation of xylophagous insects in natural biotopes

№	Xylophage-insect types (genus, family and species)	Forest farms of the Southern Archipelago region													State Biosphere Reserve
		Nukus	Beruni	Torkul	Ellikkala	Khojaly	Shumanoi	Kanlikul	Kungiro	Moynaq	Kegayli	Chimboy	Karauzyak	Takhtakupir	
1	Podura, Entomobryidae, Entomobryaatrocineta	-	+	+	+	+	+	-	-	+	-	-	+	-	++
2	Thysanura, Lepismatidae, Lepisma saccharina	-	+	+	+	-	-	-	+	+	-	-	-	-	+
3	Isoptera, Hodotermitidae, Anacanthotermes turkestanicus	t t t	t t t	t t t	t t t	t t	t	-	t t	t t t	t t t	-	t t	t t	t t t
4	A. ahngerianus	t t t	t t t	t t t	t t t	t t	t	-	t t	t t t	t t t	-	t t	t t	t t t
5	Psocoptera, Liposcelidae (Troctidae), Liposcelis divinatorius	-	+	+	+	+	-	+	-	+	-	-	-	-	+
6	Hemiptera, Cixiidae, Hyaletthesobsoletus	-	+	+	+	+	+	+	-	+	-	-	-	-	+
7	Aradidae, Aradus corticalis	-	+	+	+	+	-	-	-	+	-	-	-	-	+
8	Coleoptera, Silphidae, Phosphugaatrata	-	+	+	+	-	-	-	+	++	+	-	+	+	++
9	Scarabaeidae, Oxythyreacinctella	-	+	+	+	+	-	-	+	+	-	-	-	-	++
10	Staphylinidae, Staphylinus erythropterus	-	+	+	-	+	-	-	+	+	-	-	-	-	+
11	Anobiidae, An. Rufipes	+	+	+	+	+	+	+	+	+	-	+	+	+	++
12	Anobium pertinax	+	+	+	+	+	+	+	+	+	+	+	+	+	++
13	Elateridae, Agriotes gurgistanus	-	+	+	+	+	+	-	+	+	-	-	-	-	+
14	Buprestidae, Acmaeoderella sp.	-	+	+	+	++	+	+	+	+++	-	-	-	-	+++
15	Buprestis rustica	-	+	+	+	++	+	+	+	+++	+	-	-	-	+++
16	Trachypteris picta	-	+	+	+	+	+	+	+	++	-	-	-	-	++
17	Dermestidae,	+	+	+	+	+	+	-	+	+	-	+	-	+	++

	Anthrenus picturatus														
18	Trogoderma versicolor	-	+	+	+	-	-	+	+	+	-	-	-	-	+
19	Histeridae, Hololepta plana	+	+	+	+	+	-	+	+	+	+	-	-	+	+
20	Tenebrionidae, Adelostoma sulcatum	-	+	+	+	+	-	+	+	+	-	-	-	-	+
21	Cerambycidae, Cerambyx cerdo	-	+	+	+	+	-	+	+	+	+	+	+	+	++
22	Aeolesthes sarta	-	+	+	+	+	+	+	+	+	-	-	-	-	+
23	Saperda octopunctata	-	+	+	+	+	+	+	-	-	-	+	-	-	++
24	Curculionidae, Sitophilus zeamays	-	+	+	+	-	-	-	+	+	+	-	-	-	+
25	Sciaphobus squalidus	+	+	+	+	+	+	+	+	+	-	-	+	-	++
26	Scolytidae, Scolitus mali	-	+	+	+	+	-	+	+	+	-	-	-	-	+
27	Hylastes ater	+	+	+	+	-	-	-	+	+	-	+	-	-	+
28	Ips typographies	-	+	+	+	+	+	-	+	++	+	-	+	+	++
29	Phloeosinus sp.	-	+	+	+	+	+	+	+	+	+	+	-	-	++
30	Lepidoptera, Cossidae, Cossus cossus	+	+	+	+	+	+	+	+	++	+	+	+	+	+++
31	Hymenoptera, Apidae, Antophora sp.	+	++	++	++	++	+	+	++	++	+	+	++	+	++
32	Xylocopa valga	+	++	++	+++	++	+	+	++	++	+	+	++	+	+++
33	Megachilidae, Megachile centuncularis	-	+	+	+	+	+	+	+	+	-	-	-	-	++
34	Bethylidae, Sclerodermus domesticum	-	+	+	+	+	-	+	+	+	-	+	+	-	+
35	Formicidae, Camponotus lameerei	t	t	t	t	t	t	t	t	t	t	t	t	t	t t t
36	Diptera, Stratiomyidae, Hermetia illucens	-	+	+	+	+	+	-	-	+	-	-	-	+	++
Умумий кўрсаткич (сони)		11	36	36	36	29	21	21	29	35	13	11	13	13	36

Note: + - very rare species (1 insect found in 50 trees); + - rare species (50/4-10); -+++ - permanent types (50/11-20...); and t– swarm-forming species (t-very rare, tt-moderate and ttt-high occurrence)

From time to time, plastic film on the surface of the main tree species, in which pests were more common, extinct xylophagous insects were found under the bark of the damaged places, and *Anobium pertinax*, *A. punctatum*, *A. rufipes* species from the order Coleoptera were noted as dominant species, *Priobium carpini*, *Oligomerus brunneus*, *Acmaeoderella* sp., *Buprestis rustica*, *Trachypteris picta*, *Melanophila picta*, *Cratomerus intermedius*, *Hylotrupes bajulus*, *Saperda octopunctata*; *Xylocopa valga*; *A. turkestanicus* and *A. ahngerianus*.

CONCLUSIONS

Currently, the country of Uzbekistan pays special attention to the inventory of the animal world, the protection of rare species, the identification of harmful species and the development of measures to combat them. In this regard, the species composition and regional distribution of pests associated with various industries, in particular, the factors affecting their reproduction, have been evaluated, and preventive measures have been developed against them.

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Rezume: *Ushbu maqolada ksilofag hasharotlarning ko'payishining asosiy sabablaridan biri Janubiy Orolbo'yining tabiiy biotopining katta qismi qumli-cho'l hududlaridan bo'lganligi, bu esa zararkunandalarning rivojlanishiga qo'lay o'rin ekanligi aytilgan. Shuningdek, tabiiy biotopda hasharotlarning taksonomik birligini, ularning zararkunandalik xususiyatlarini o'rganish va ularning tarqalish darajasini kuzatish masalalari yoritilgan.*

Резюме: *В этой статье говорится, что одной из основных причин роста насекомых-ксилофагов является то, что большая часть естественного биотопа Южного Приаралья поступает из песчаных пустынь, что является благоприятным местом для развития вредителей. Освещаются также вопросы изучения таксономического единства насекомых в природном биотопе, особенностей их вредителей и наблюдения за степенью их распространения.*

Kalit so'zlar: *Janubiy Orolbo'yi, hudud, o'rmonlar, tarixiy ob'ektlar, turlar, ekologik muammolar.*

Ключевые слово: *Южное Приаралье, территория, леса, исторические объекты, виды, экологические проблемы.*

UDC 564.48.01

NEGATIVE INFLUENCE OF THE PERSON ON GROUND AND FETTER OF THEIR REDUCTION

Alimbetov A.A.¹, Khabibullaev A.J.¹, Allamuratov M.O.¹, Kazakbaev B.M.²,
Muxamedgalyev B.A.³

¹Karakalpak State University named after Berdakh², Karakalpak Republican Regional Training Center of the National Guard of the Republic of Uzbekistan,

³Tashkent University of Architecture and Construction

Summary: Analysis of the negative influence of the person is brought in article on ground. It is shown that ground fund of our planet is the most varied category lands characterized by combination - from intensive used before unfit for use glacier and desert. It is installed that use the land of the person at time is indicative of expansion before the last time of the farmlands, particularly in economic not strong country.

Key words: erosion, ground, anthropogenic, departure, conversion, recuperation, desertification, ecosystem, vegetable cover, arid zone.

The soil provides all the renewable resources of flora and fauna. It is difficult to overestimate the importance of the soil: it is the basis of agriculture and forestry. It is unlikely that mankind will be able to exist independently of the soil - the basis of material wealth and its main wealth. And although it itself is the result of a long natural-historical process, at present the quality of soils is largely determined by the nature and intensity of human economic activity.

The land fund of our planet is characterized by a combination of the most diverse categories of land - from intensively used to unusable glaciers and deserts.

An analysis of human use of land over time indicates the expansion of arable land until recently, especially in economically underdeveloped countries. "Over the past 80 years, the plowed land has doubled [1; 87-89]. In most economically developed countries, the plowing of the territory has been stable in recent years (it is more profitable for these countries to invest in the intensification of agriculture than in the development of new lands). However, in general, the trend towards the expansion of the area of arable land persists in the world, especially noticeable in the developing countries of the hot zone.

The area occupied by buildings, ground communications and other engineering structures is steadily growing. The increase in such residential areas occurs mainly due to arable land, and, as a rule, highly productive. Thus, a chain arises: urban lands are crowding out rural lands, and the latter are expanding at the expense of forests and pastures. Ultimately, the area of forests is shrinking and their quality is deteriorating. At first, light forests and shrubs are used as pastures, and then they are either plowed up or built up. Usable land reserves on our planet are running out. There remain lands, the development of which most often requires huge expenditures. In addition, in case of improper operation, significant losses of land can occur due to the development of erosion, salinization, desertification, deforestation, direct destruction during mining or soil pollution. The damage caused by these processes to the global land fund has recently assumed alarming proportions throughout the world. I will focus on the main causes of the deterioration of the quality of land resources and measures to combat them.

Under the influence of human activity, accelerated erosion occurs, which often leads to the complete destruction of soils. With accelerated erosion, the loss of soil components is not compensated, and there is a sharp decrease in its fertility. Moreover, soil destruction proceeds 100-

1000 times faster than during natural erosion processes. "As a result of accelerated erosion over the past century, 2 billion hectares of fertile land, or 27% of the land of active agricultural use, have been lost on our planet."

Soil erosion in the United States has become a national disaster. Especially strong erosional processes began to develop there in the last 170-200 years, that is, since the mass plowing of land. As a result of soil erosion in this country, 4 billion tons of the top, most nutrient-rich soil layer, which contains more than 90 million tons of basic plant nutrients, is annually washed away. Currently, the US government allocates a lot of money for erosion control, and this gives positive results [2; 360-368].

In Latin America, soil erosion covers 75% of arable land. This is due to the use of burns, deforestation, slash-and-burn agriculture and monoculture. Brazil's massive deforestation is predicted to create a second Sahara.

Erosion is also very widely developed in the Mediterranean countries, India, Pakistan, China, Iran, and Africa.

Erosion is promoted by a number of both anthropogenic and natural factors. Among the anthropogenic factors, the plowing of soils without the use of anti-erosion measures plays an important role.

Under natural conditions, the fertility of the soil is constantly maintained by the fact that the substances taken by plants return to it again with the litter, mineralize and enrich it again. In modern agriculture, however, only a small part of the produced biomass returns to the soil every year, the rest is irretrievably carried away with the harvested crop.

Monocultures deplete the soil especially strongly. Monoculture has become the main scourge of modern agriculture: the cotton and corn belts of the United States, the wheat belts of Argentina give us the most striking examples of its destructive effect [3; 230-235].

The rate of erosion processes increases if such incorrect agrotechnical practices are used as plowing and intensive use of erosion-prone lands without proper anti-erosion protection, plowing along the slope and areas with large slopes, as well as incorrectly established specialization of the economy.

The development of erosion is promoted by the destruction of forests, depriving the soil of its protective cover. In addition, the thermal regime changes in clearings, rapid heating and drying of soils occur, and clearings also affect wind speed.

And one of the main causes of accelerated erosion, which is mainly observed in developing countries, is excessive grazing, which upsets the balance between the rate of destruction and restoration of vegetation cover.

Another important problem that is closely related to accelerated erosion is desertification. Desertification is a process that leads to the loss of a continuous vegetation cover by a natural ecosystem with the further impossibility of its restoration without human participation. Occurs mainly in arid areas as a result of natural and predominantly anthropogenic factors (destruction of sparse vegetation due to overgrazing (the basis of agriculture in these areas is nomadic animal husbandry); plowing of former pasture areas; cutting down trees and shrubs (for fuel); disturbance soil cover as a result of road, industrial construction and other types of economic activity).

According to climatic data, deserts and semi-deserts occupy more than a third of the land surface, and over 15% of the world's population lives in this territory. Only as a result of human economic activity over the past 25 years, more than 20 million square kilometers of deserts have appeared. Now desert territories occupy about 40% of the land. And another 30 million square kilometers are under the threat of desertification.

This danger is felt by more than 100 countries of the world and, first of all, developing countries. "The areas with the highest degree of desertification are in Asia - about 19%, in Africa - 23%, in Australia - 45% and in South America about 10% of the total territory." The countries of

the African continent are especially affected, in particular, in Mauritania, due to the progressive drought, 250 thousand square kilometers are under the threat of severe desertification. The Sahara desert is moving south at an average speed of 6 km/year, so out of 200,000 hectares of rainfed land, only 50,000 hectares remain suitable for agricultural work. In Mali, over 30% of its territory is under the threat of desertification [4; 400-402].

Secondary soil salinization is a scourge of irrigated landscapes in arid climate with a long dry season. Secondary salinization is the process of accumulation of easily soluble salts in the upper layers of the soil, which have a detrimental effect on plant communities. The main reasons are: immoderate, unsystematic watering of lands in the absence of drainage, violation of the water balance by seepage waters of irrigation systems, especially in arid regions.

It is known that even with weak soil salinity, crop yields are sharply reduced (cotton by 50-60%, barley by 30-40%, corn by 40-50%, wheat by 50-60%), and with stronger salinity, some crops (for example, wheat) die completely. 270 million hectares are irrigated in the world, of which 40% is subject to secondary salinization. For example, in Pakistan, 75% of the irrigated land area is saline, in Iraq and Iran - more than 50%, in Egypt - 44%, in the USA - more than 27% [6].

Centuries of clearing forests for arable land and pastures, collecting firewood, and industrial harvesting have reduced the area of forests by one third. Although 40% of the earth's land is still covered with woody vegetation, the state of the forests cannot be considered safe. The annual volume of forest felling is more than 3 billion cubic meters, which has a great impact on the radiation balance, atmospheric circulation and air humidity, and the water regime of the land.

The extraction of mineral raw materials leads to the formation of specific anthropogenic landscapes - mining. The greatest destruction of the earth's surface occurs with the open method of mining, which accounts for more than 25% of the volume of mining in our republic [6].

The area of territories disturbed by mining is especially large in the USA, Germany, Romania, France, etc., in particular in the UK, open-pit mining has led to the degradation of agricultural land on an area of 70 thousand hectares. Mining contributes to the destruction of vegetation cover, the emergence of man-made landforms, changing the regime of groundwater, pollution of the air basin, surface drains, deformation of parts of the earth's crust. Local subsidences of the earth's crust in coal mining areas are known in the Silesian region of Poland, in Great Britain, the USA, Japan, etc.

The problem of waste is currently very acute in many countries of the world. Thus, about 150 million tons of waste are generated annually in US cities, and by 2020 their volume is expected to increase by another 20%. In Japan, the amount of household waste exceeds 72 million tons annually [6].

For many years, we have been conducting research to reduce the negative anthropogenic impact on the soil. For this purpose, we are developing various highly swellable hydrogels synthesized on the basis of local raw materials. The preliminary studies of the hydrogels developed by us in the Aral Sea zone showed that they can be used in case of water shortage, to prevent the drying of the earth, soil salinization, to save mineral fertilizers, and to prevent the emergence of various harmful bacteria in the soil [7; 264].

It has been established that the introduction of seeds into the soil together with the hydrogel improves the germination, growth and survival of some plant species.

Thus, in recent years there has been a sharp deterioration in the land resources of our planet. The use of new and advanced technologies developed by scientists around the world can, to a certain extent, reduce the global problem of desertification and soil pollution, since exposure to toxic substances through the soil leads, as well as through air and water, to the same diseases. This whole triad - air, water, soil - affects the same person, destroying his body.

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Rezyume: Maqolada insonning yerga salbiy ta'sir etishining taxlili batafsil keltirilgan. Planetamizning yer fondi turli toifali tuprok resurslari bilan belgilanishi, ya'ni samarali kullaniladigan va kishlok xujaligi uchun yaroksiz bulganlari, muzliklar, chullarga toifalanishi kursatilgan. Vakt maboynida yerning inson tomonidan ishlatilishi shudgorlanadigan yerlarning salmogini ortishi evaziga borganiligi aniklangan.

Резюме: В статье приведен анализ негативного воздействия человека на почву. Показан, что земельный фонд нашей планеты характеризуется сочетанием самых разнообразных категорий земель - от интенсивно используемых до непригодных для использования ледников и пустынь. Установлено, что использования земли человеком во времени свидетельствует о расширении до последнего времени пахотных земель, особенно в экономически слаборазвитых странах.

Kalit so'zlar: eroziya, tuprok, antropogen, chikindi, kayta ishlash, rekuperatsiya, chullashish, ekosistema, usimlik katlami, arid xudud.

Ключевые слова: эрозия, почва, антропогенный, отход, переработка, рекуперация, опустынивание, экосистема, растительный покров, аридная зона.

SOME ASPECTS OF THE STUDY OF GROUNDWATER OF ACTIVE WATER EXCHANGE

Toshev Sh.D.¹, Kholzhigitov Sh.B.², Dzhaksymuratov K.M.³,

¹ State Establishment "Institute of Hydrogeology and Engineering Geology". ²Tashkent State Technical University named after Islam Karimov, ³Research and Innovation of the Nukus Mining Institute at the Navoi State Mining and Technological University,

Summary: The article examines the territory of the Karakalpak Ustyurt, which in the recent past was only a wealth of pasture lands of cattle breeding, and now it has turned into a geological province. A lot of rich minerals, hydrocarbon deposits, solid minerals, thermal groundwater and other types have turned the Karakalpak Ustyurt into one of the most important mining and industrial regions of the Republic of Uzbekistan.

Key words: Karakalpak Ustyurt, groundwater, active water exchange zone, wells, karst valley, depressions, sediments, aquifer, artificial groundwater reserves.

Introduction. The territory of the Karakalpak Ustyurt in the recent past was famous only for the richness of pasture lands of distilling livestock. Currently, it has become famous as a geological province. A lot of rich minerals, hydrocarbon deposits, solid minerals, thermal groundwater and other types have turned the Karakalpak Ustyurt into one of the most important mining and industrial regions of the Republic of Uzbekistan. As is known, the extensive development of all branches of the national economy and the fullest use of the natural resources of the Karakalpak Ustyurt, as well as any territory of arid regions, are closely related to the problems of searching for fresh and technical groundwater for the purposes of water supply to the population and industrial enterprises. In this regard, the purpose of our dissertation research was to study the current conditions of nutrition and formation of groundwater resources of the Karakalpak Ustyurt [1, 11].

Discussion of the results. Belonging of the studied territory to the arid zone, the absence of surface watercourses at the same time predetermined the leading role of groundwater not only for watering pastures, but also for water supply of mining and oil industry facilities.

N.K. Ignatovich [3] in his research described from a hydrogeological point of view the zones of active, obstructed and stagnant groundwater regime. According to the author, in the active regime zone in the upper part of the section, groundwater has a relationship with precipitation and river waters. Based on a lot of factual material on the Eastern European Platform, he proposed using the following factors for active regime zones

- priorverhnochnoy honor zones of the active regime due to geohymic and hypergenic changes with complex factors vyvivanyya;
- groundwater actively interacts with surface waters;
- complete drainage of water-resistant surfaces and areas of drainage and drainage of the river SETI (drainage area of 300 m and pain);
- genetic (infiltration, residual or sedimentation) types of waters and sources of replenishment of groundwater resources, waters of modern meteoric origin. And also their dynamic resources prevail over static ones;
- the dynamics of the geochemical process represented by the active recovery of chlorides and sulfates, killing the population from the mountain to the depression, and the growth in the drying conditions of the climate;
- water of the same chemical type has the most abundant hydrocarbon and Sulphate; Sulphate-chloride type of water widely distributed in the dry climate of the soil depressions.

E. V. Pinneker [6], the analysis of the anomaly of the vertical hydrodynamic zone was carried out, that the vertical zone is the same as the vertical zone. This can be shared:

- to the upper zone of intensive (active or free) water exchange;
- to the middle zone of delayed (obstructed) water exchange

in the Lower Zone of passive (VES'ma zutnennogo) or stagnant water regime. According to the Angaro-Lenskom bassejn [6], the results were obtained, and the hydrodynamic vertical zones of the water regime were observed. Zone of active regime of water treatment grutovy VOD radeleni na: - glubin interval from 0.0 to 300.0 m; -speed of underground water (m/Sut): $p - p-10''$; -length of period of water treatment regime 0.00005 – 0.05 (ML. flight); -srednje otološenie Ne/AG: < 0.0005 – 0.002; d) underground line growth (mln flight): < 0.05 – 0.2.

In the world practice of studying the water exchange zone, such works are known as improving and verifying moisture exchange models in the "surface water – aeration zone – groundwater" system in humid and arid conditions based on experimental studies and monitoring of moisture exchange conducted by Russian and Chinese project participants. The work was carried out based on research materials at the Zvenigorod training ground of Lomonosov Moscow State University (Moscow Region, Russia) and in the lower reaches of the Heihe River (Inner Mongolia Autonomous Region, China). Automated monitoring systems for surface waters, aeration zones and groundwater have been installed at these facilities. According to the results of a comparative analysis of the conditions for the formation of the water balance of the aeration zone and the relationship of surface and groundwater in arid and humid conditions based on mathematical modeling:

seasonal and long-term patterns of moisture movement in the aeration zone during the formation of infiltration water exchange in the considered typical climatic conditions and their impact on the results of monitoring of the object in question are revealed;

the interaction of surface and underground waters and the role of soil moisture and vegetation in the formation of the water regime of landscapes are investigated;

work has been carried out to improve, develop and test computational geohydrological models to describe non-stationary processes of moisture exchange and geofiltration in different climatic conditions; sensitivity analysis of geohydrological models to input parameters in arid and humid conditions has been carried out;

proposals have been developed on the composition and methodology of model-oriented regime observations in humid and arid conditions.

The developed methodology of data analysis of monitoring and modeling of geohydrological processes, which allows to assess the influence of landscape conditions on the formation of components of the water balance and, in particular, infiltration feeding (evapotranspiration discharge) of groundwater. For the first time, zoning of the territory according to the types of groundwater regime and assessment of groundwater discharge were performed for the lower reaches of the Heikhe River. In methodological terms, the proposed approach to the interpretation of regime observations in the evapotranspiration discharge zone seems to be quite new, since it includes an assessment of the parameters of evaporation of groundwater by modeling moisture transfer in the aeration zone and analyzing fluctuations in the groundwater level of various durations (seasonal and intra-day).

In such a complex formulation, it is possible that earlier the assessment of groundwater evaporation was not carried out either for the object under study or for other arid territories.

Classification of water availability factors according to V.A. Sherstnev consists of rocks of aquifer complexes of the zone of active water exchange. Territories with weak hydrogeological study use the results of their geological, geomorphological structure and hydrometeorological parameters to identify areas with varying degrees of water content of water-bearing rocks. Territories with a good study of hydrogeological conditions use the results on the degree of water-bearing rocks and characteristics of their structural and tectonic structure [8,9].

The water content of rocks in the zone of active water exchange is primarily determined by the mineralogical composition and structure, their condition in aquifers, the capacity of which depends on the reservoir and filtration properties at the contacts of heterogeneous rocks, the relationship of water-containing sediments with underlying and overlapping horizons, i.e. a complex of factors depending on the genesis of rocks. They, in turn, are combined into a single lithological and genetic group of water-bearing rocks. The structural-tectonic group of factors of water-bearing rocks are combined into various plicative structures or their elements and of different ranks of faults in the Earth's crust [9].

The influence of other groups of factors on lateral changes in the water content of rocks has a merciless local character and leads to the formation of sections of water-rich zones. At the same time, the dismemberment of the relief is an exception to the rule. Thus, the higher density of surface watercourses is due to the lower water availability of such areas of the territory [9]. The factors affecting the water content of aquifers in the zone of the active regime of water exchange, and the types of their manifestations are reflected in the generalized Table 1. The term "regional" and "local" is used in order to display the difference in distribution areas. The gradation of objects is quite conditional and can be attributed to local or regional.

According to the characteristics of geological, structural-tectonic, Geological-geomorphological structure and climatic-meteorological conditions of the territory, it is possible to see areas with different water abundance. And, perhaps with a definite degree of achievement, it can be characterized by a structural-tectonic structure that covers the knowledge of the water abundance of births in the study of lands. For example: the investigations of G. A. Maximovich and G. K. Mikhailov [4], on local structural floors, in tectonically active regions, produced high three-fold offspring compared to adjacent regions. Especially in certain climatic and lithological-petrographic conditions, the subterranean stock modules on similar floors are increased in 2-3 times, as they are included with monoclinical structures.

Table 1

The main factors influencing the water availability of water-bearing fuels and complexes in the zone of active water regime

the spread of the manifestation on the sites	origin	The main factors
Regional	Geological and lithological	Mineral composition
		Textural structure of sediments
		Structural state of sediments
		Thickness power
	Geological and tectonic	Geodynamic movements of the Earth's crust
		Modern movements of the Earth's crust
Local	Climate and meteorological	atmospheric precipitation on the territory of the development of aquifers
	Structural and tectonic	Plicative tectonic structures
		Faults of various grades
	Geological and geomorphological	Tectonic cracks
	Lithological	Highly dissected relief
		Rocks of heterogeneous thicknesses

V. N. Safonovym U kraevskih participation of artezian bassinov Lesnykh and lesostepnykh landshafts composed geoecological assessment of the territory and specifications of landshaftn-hydrogeological zone of the all-water regime. In this study, the study of landshaftykh conditions and the zone of the water treatment regime, and also proposed for the territory of Mordovii (Russia)

methodical analysis of the structure of the water treatment zone for the whole water treatment system by proktov [7].

In the 70s of the last century, researchers [5] studying paleohydrogeology distinguished two hydrodynamic floors: -the upper floor includes a zone of free and obstructed water exchange; -the lower floor is represented by a zone of a very difficult water exchange regime. A similar gradation is used in the classification for periods of infiltration nutrition for artesian basins and sedimentation stages (Table.2) proposed by L.G. Zavarzin [2]. The two periods identified are fundamentally different: during periods of infiltration processes, vertical sections of basins are represented by three hydrodynamic zones (free, obstructed and very obstructed water exchange); during sedimentation of horizons, basins do not receive infiltration nutrition and are determined only by the presence of zones of very obstructed water exchange.

Table 2

Comparison of schemes of hydrodynamic zonality of groundwater

Scheme of hydrodynamic zonality						
Lichkov, 1931, 1933; Makarenko, 1937, 1939; Ignatovich, 1944,1947	Khodkov, Valukonis, 1966,1968		Zavarzin, 1969		Yezhov, Vdovin, 1970	Kenesarin, Sultankhodzhaev, 1964; Kisin, 1967; Zaitsev, 1970; Khasanov, 1976
Active water exchange zone	Upper zone	Aeration subzone	Aeration zone		Hydrostatic zone	Upper floor
The zone of impeded water exchange		Filtering subzone	Free water exchange zone			
Stagnant groundwater zone	Middle zone		The zone of impeded water exchange			Lower floor
	Lower zone	The zone of very difficult water exchange	Upper subzone	Transition zone		
			Lower subzone	Lithostatic zone		

Conclusions. In such an image, research, devoted to the hydrodynamic zone of the underground, practically not considered in the American and European hydrogeological literature. Non-glasno slovosochetanie "vertical zone underground" presents geohymichesky or gidrogeohimichesky parameters. A "low-temperature geochemistry" (low-temperature geochemistry) is widely used in the United States [10,12], and in many universities of the geological faculties read a subject with an analogous name. The low temperature zone of underground water is analogous to the zone of active water exchange.

At the end of the sixteenth century and at the end of the semidesite years of the last century, a significant number of hydrogeological investigations were carried out by means of the preparation and application of subterranean waters, and also a great work of fruitful scientific research of semi-scientific results, Kotor they found their research in dissertation works and monographs A. S. hasanova, N. N. khodzhibaeva, A. N. sultankhodzhaeva, H. T. tulyanova, A. S. Vishnyakov, A. A. avanesova, Z. sidykova, H. R. dushkhzhaeva, U. M. ahmedsafina, N. A. enesarina, S. S. Mirzaeva

et al. Analysis of the conducted analysis of the hydrodynamic zone as a complex geological-hydrogeological process, which is subject to the subsequent change in the ideal view in rare cases. Hydrodynamic zones are combined with different types of anomalies, thanks to the formation of glyphs by tectonic fractions or lithological shafts, the distribution of tectonic forces and other geological-tectonic conditions.

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Rezyume: Maqolada yaqin o'tmishda faqat chorvachilik uchun mo'l-ko'l yaylovlar bo'lgan, hozir esa geologik viloyatga aylangan Qoraqalpoq Ustyurt hududi ko'rib chiqiladi. Ko'plab boy foydali qazilmalar, uglevodorod konlari, qattiq foydali qazilmalar, termal er osti suvlari va boshqa turlari Qoraqalpog'iston Ustyurtini O'zbekiston Respublikasining eng muhim tog'-kon sanoati mintaqalaridan biriga aylantirdi.

Резюме: В статье рассматривается территория Каракалпакского Устюрта, которая в недавнем прошлом представляла собой лишь богатство пастбищных угодий скотоводства, а в настоящее время превратилась в геологическую провинцию. Множество богатых полезных ископаемых, месторождений углеводородов, твердых полезных ископаемых, термальных подземных вод и других видов превратили Каракалпакский Устюрт в один из важнейших горнопромышленных районов Республики Узбекистан.

Kalit so'zlar: Qoraqalpoq Ustyurti, yer osti suvlari, faol suv almashinish zonasi, quduqlar, karst vodiysi, botiqlar, cho'kmalar, suvli qatlam, yer osti suvlarining sun'iy zahiralari.

Ключевые слова: Каракалпакский Устюрт, подземные воды, зона активного водообмена, колодцы, карстовая долина, котловины, отложения, водоносный горизонт, искусственные запасы подземных вод.

**DYNAMIC CHANGES OF PLANTS COVER OF THE SOUTHERN ARAL SEA REGION
UNDER THE INFLUENCE OF ANTHROPOGENIC AND TECHNOGENIC FACTORS**

Serekeeva G. A., Dosjanova G. D.

Karakalpak State University named after Berdakh

Summary: *In article the comparative analysis of a current state of flora of Karakalpakstan on areas of growth is considered. The shape of flora is defined in many respects by the endemic plants which are its part. In total for the territory of the Republic of Karakalpakstan together with adjacent areas 176 endemic are allocated.*

Key words: *Republic of Karakalpakstan, flora, endemic plants, anthropogenic and technogenic factors, ecosystem*

INTRODUCTION.

The Republic of Karakalpakstan is located in the Southwestern Aral Sea region and is part of the extra-arid zone of Central Asia. The climate is sharply continental, the soils are saline.

The problem of guard and rational use of environment require the deep study of processes in the ecosystems, exposed to anthropogenic influence. Presently as a result of the inefficient use of water resources, excessive anthropogenic loading, exceeding the threshold of stability of natural ecosystems, the process of anthropogenic desertization of territory develops in Southern Aral Sea region (on the example of Republic of Karakalpakstan), that is a complex of the degradation processes, related to the decline of the biological productivity of ecosystems, impoverishment of plant specific composition, solinization, deflation of soils and other negative phenomena [1, 3].

A technogenesis is totality of processes, arising up and developing in natural ecosystems under act of building and use of engineering building, their complexes, and also the technical equipments applied at their creation. Influence of technogenesis on a vegetation is the difficult system of different processes. A technogenesis renders the strong operating on a plant cover. Influence it is varied and studied not sufficiently [3]. The phenomenon of technogenesis is investigational not sufficiently in the arid landscapes of Karakalpakstan.

MATERIAL AND METHODS.

Every natural complex has the characteristic plant associations and, in this connection, specific composition of fauna and state of populations of animals. Presently, because of drying out of the Aral Sea area, the balance of ecosystem of Southern Aral Sea region is distorted, pressing on natural complexes here arrives at emergency force, everywhere there are an anthropogenic desertization and aridization.

On the first stage studied the ecological structure of territory on that research was assumed. Distinguished the basic general groups of ecosystems- Tugay, sandy-loam-loamy, sandy, gipseous and salt-marsh deserts. Further conducted an embryonization on signs, i.e. geomorphological signs and prevailing of phytiums or their groups on classification of K.Z. Zakirov (1978). The next stage of researches were collection and systematization of information about technogenic processes developing on investigational territory.

RESULTS AND DISCUSSION.

Presently actuality of regional floristic researches increases for territories of the intensive economic use. Basic aspect of vegetation of plateau Usturt in Southern Aral Sea region is a small number of kinds in a flora and their dynamic quality. As a result of it numerous ecological niches remain unfilled, and present instability of ecosystem on the whole.

Flora of Usturt counts about 600 types of higher vascular plants among that basis is made by a pigweed (20%), cereals (10%) and cruciferous (9%), constituents together more than half of all

specific variety of flora; leguminous, borage, clove, liliaceous and buckwheat together make about 20% [2, 4].

In a climatic relation Usturt is a difficult and original object, on territory of that a continental climate dominates sharply. The maximal temperature of air in July arrives at more than 47°C the average monthly temperature of July and August 30°C. Winter is cold, average monthly to the temperature of January - 12,9°C, in separate days arrives at to more - 30°C fogs, ice-storm, snow-storms and short period of time thaws, are frequent In winter annual amplitude of temperatures for central part of Usturt 36-38°C, the fall amount of atmospheric fallouts on a south makes a 90 mm, in the north – 120 mm [3, 4].

The plants world of Usturt is poor enough. Half is bushes most widespread here are different types of *Absinthium officinale*, *Anabasis salsa*, *Halocnemum*. From arboreal breeds here a *Haloxylon* grows only as small and rarely sparse groves, many of that remind rather shrub, than arboreal, planting. Last years here found out the rare jungles of *Populus diversifolia* [4, 5].

The plants cover of steppified valleys very declivous and shallow is presented mainly by *Absinthium officinale* saltwort associations with cereals, first of all by feather-grasses; placed there are steppe bushes and different

herbares. Takyr is especially characteristic for the landscapes of South Usturt. They have a pied enough vegetation [2, 5]. If the takyr lowering is deeply cut in and the small lenses of underwaters appear under him, then on such takyr a camel thorn overgrows thickly. Meet on takyr and *Capparis spinosa* is a bush with beautiful white colors. Therefore among *Anabasis salsa* of the gypseous desert of takyr of South look very picturesquely.

Characteristic for Usturt internal-drainage cavities arrive at enormous sizes sometimes. For example, the famous cavity of Barsakelmes occupies an area about 2000 apt. kilometer, and one of the littlest – Shakhakhta - approximately 45 apt. km It is the most difficult of access and insufficiently known areas of Usturt [2; 61-65, 5].

In general complication for territory of Republic of Karakalpakstan together with contiguous districts 176 endemics [4] is distinguished. From them karakalpak endemics 9 types and subendemics are 167 types (about 18% of all flora of Karakalpakstan) [1, 4]. The basic representatives of group of karakalpak endemics are the following: *Anabasis ebracteolata*, *Turania deserticola*, *Xylosalsola chiwensis*, *Ammodendron conollyi*, *Lappula parvula*, *Astragalus villosissimus*, *Scorzonera bungei*, *Cousinia dolichoclada*, *Ferula foetida*, *Artemisia turanica*.

Presently anthropogenic affecting plant cover of plateau Usturt was caused by the changes of natural vegetation. The modern dynamics of plant associations is related to anthropogenic influence. She is determined by the changes of graphic terms, under influence of technogenic factor, and also unsystematic pasture on a background the general aridization of climate. By basic anthropogenic factors influencing on the ecosystems of Usturt are an unsystematic pasture of cattle and technogenic factor [3]. They cause forming of man-made ecosystems, technogenic destructions of gypsiferous, destruction of surface of takyr, and also origin of technogenic takyr and saline lands.

Thus, basic threats for biodiversity of the plant world of Usturt reduction and crushing of habitats, unsteady use of pastures are considered, increase industrial mastering secret service exploitation of natural gas building of the claotype and asphalt-paved roads etc. Examining a plateau Usturt as standard to territory of the deserted area, we do not suggest to organize the guard of botanical objects with the purpose of maintenance of gene pool and biological variety of the deserts.

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Rezyume: *Maqolada Qoraqalpog'iston florasining hozirgi holatini o'sish hududlari bo'yicha qiyosiy tahlil qilish ko'rib chiqiladi. O'simlik dunyosining ko'rinishi asosan uning tarkibiga kiradigan endemik o'simliklar bilan belgilanadi. Qoraqalpog'iston Respublikasi hududida qo'shni hududlar bilan birga jami 176 ta endemiklar aniqlangan.*

Резюме: *В статье рассмотрен сравнительный анализ современного состояния флоры Каракалпакстана по ареалам произрастания. Облик флоры во многом определяют входящие в ее состав эндемичные растения. Всего по территории Республики Каракалпакстан вместе с прилегающими районами выделено 176 эндемиков.*

Kalit so'zlar: *Qoraqalpog'iston Respublikasi, flora, endemik, o'simliklar, antropogen va texnogen omillar, ekotizim.*

Ключевые слова: *Республика Каракалпакстана, флора, эндемичные растения, антропогенные и техногенные факторы, экосистема.*

UDC 502.2.08

IDENTIFICATION OF ACTIVE STRAINS OF OIL DESTRUCTORS ISOLATED FROM SEA WATER IN THE PORT BAUTINO

**Musayeva Zh.K.¹, Koibakova S.E.², Allamuratov M.O.³, Khabibullaev A.J.³,
Kazakbaev B.M.³, Turdibaev K.P.³**

¹*Almaty University of Power Engineering and Telecommunication,*

²*Caspian State University of Technologies and Engineering named after Sh. Esenov,*

³*Karakalpak State University named after Berdakh.*

Summary: *Currently, the problem of the negative impact of petroleum hydrocarbons in the Caspian Sea has become catastrophic. Intensive pollution of marine waters by oil and oil products, from production, transportation and storage of hydrocarbons leads to the oppression of the sea ecosystem. Mechanical and physico-chemical methods for cleaning the marine environment are characterized by low efficiency, secondary pollution and high cost. The most promising is the use of microbiological methods for cleaning waters from oil pollution. In the article presents the results of the identification of reactive oxidizing bacteria isolated from the marine environment of the Caspian Sea, for further use in new biopreparation from oil pollutions.*

From the sea water in bulk berths Aktau sea port and the port of Bautino (North Caspian) allocated 27 hydrocarbon isolates of microorganisms having the ability to oil degradation of these strains selected the 4 most active cultures, which were identified as Bacillus cereus (2 strains), strain Bacillus sr.13 and Acinetobacter sr.10.

Key words: *identification, morphological, cultural and biochemical properties of oil destructors, sequencing, pure culture*

INTRODUCTION

The North Caspian is a unique water area, the hydrological and hydrochemical regime of which is formed by complex processes due to frequent storm activity, water convergence, shallow water, salinity variability and the influence of river flow.

In the general chain of human-hydrosphere interaction, an important link belongs to the management of the marine environment, where high economic activity is carried out and flows of pollutants coming from both the land and the sea face. Recently, water areas have suffered most from oil pollution, mostly of anthropogenic origin. Intensive marine pollution by oil and oil products, from production, transportation and storage of hydrocarbons lead to the oppression of the sea ecosystem. The most promising is the use of microbiological methods for cleaning waters from oil pollution. This is because the microorganisms effectively, quickly and without additional damages to the ecosystem can remove.

Microflora is a sensitive indicator of changes in the conditions of their environment, which is formed from various physiological groups of microorganisms. The number and activity of microflora are largely dependent on environmental and geographical factors. The processes taking place in water bodies are closely related to the number of microorganisms.

It is in a situation of developing oil fields that it is of interest to monitor studies, identify patterns of distribution of microscopic organisms, and use highly active strains to create biological products for cleaning the marine environment from oil products.

Main part: For the most complete and quick purification of waters from oil products cheaper to use aboriginal strains of microorganisms that do not need to adapt to the environment

into which they are introduced. These bacteria begin destruction of oil faster than those microorganisms that allocated from other biotopes.

For the emergence of biologics to allocate initially from seawater active bacteria-oil destructors, determine their hydrocarbon-oxidizing activity, make an active consortium of microorganisms, identify, etc.

The aim of this study was the identification of active oil destructors strains isolated from seawater near the port of Bautino.

To achieve this goal, the following tasks were:

1. Conducting primary identification of the strains by culture-morphological, physiological and biochemical properties;

2. Phylogenetic identification of strains carrying-based sequencer variable regions of the genes encoding 16S rRNA;

The object of the research were 4 strains of microorganisms: *Bacillus* sp. 7 (B-1), *Arhtrobacter* sp. 13 (P-7), *Bacillus* sp. 27 (B-4) and *Serratia* sp. 10 (S-8) which was obtained from seawater near the Caspian Sea Bautino port.

To identify strains used cytochemical methods and biochemical researches.

Preliminary identification of the isolated microorganisms was performed by culture-morphological, physiological and biochemical characteristics, using the work of many authors [1-8].

For the identification of genetic strains were sent to the "State Research Institute of Genetics" PA on solid medium and M9 as well as IIB liquid medium, cell titers was 10⁶ CFU / ml. The species identification was performed by polymerase chain reaction and further sequencing of PCR fragments of 16S rRNA gene using a universal primer system [9-10].

Thus, held primary identification obtained pure cultures. Research was performed on liquid or solid nutrient mediums are shown in (table 1).

Table 1 - Growth of pure cultures in various mediums

Name of culture	Growth in the BCH	Growth in the IPA	Growth on M9 with oil
<i>Bacillus</i> sp. 7 (B-1)	Abundant growth in the form of flakes of cotton, lumps suspended	Colonies larger than 2 cm in diameter, grow on agar, with not even a fringed edge, folded, convex, dull, gray	colony point, convex, gray, dull, flat edge of the colonies, mucous consistency
<i>Serratia</i> sp. 10 (S-8)	Weak growth film on a surface of the medium	colony of large, round with smooth edge, slimy, transparent, beige	colony point, convex, glossy, gray-pink, mucous
<i>Arhtrobacter</i> sp. 13(P-7)	Uniform turbidity environment	colonies are round with a straight edge, slimy, beige, black pigment allocates to meduim	point, convex, glossy, gray
<i>Bacillus</i> sp. 27 (B-4)	Weak growth film on a surface of the medium	colonies are round with no flat edge eroded, convex, dull, gray, gray pigment forms	colony point, convex, gray, frosted

A result of research noted that the two strains (S-8, B-4) with an increase of the liquid medium is observed weak growth to form a film on the surface of the medium. In strain R-7 noted

uniform turbidity environment. The most intensive growth to form flakes and lumps noted for strain B-1 (table 1).

When grown in IPA noted that among the studied cultures for two strains (P-7 and B-4) is characterized by the appearance of the pigment on the surface of nutrient agar, colonies of all strains are characterized by large size, intensively proliferating medium surface. Strains B-1 and B-4 are characterized by a matte surface of the colonies, strains S-8 P-7 and surface gloss. When grown in M9 medium for the growth of all the strains noted point convex colonies. Strains B-1 and B-4 M9 medium matte, and strains S-8 P-7 and glossy.

When studying the cytochemical properties of the strains noted that three strains lack of acid resistance characteristic of the cell walls. The results are shown in (table 2).

Table 2 - Results of the morphological properties of the pure cultures of

Name of culture	Gram stain	Determination of acid-fast bacilli by Ziehl-Nielsen	Stained bacterial spores by Ziehl-Nielsen modified by Mueller
Bacillus sp.7 (B-1)	T + Sticks, 0.8 x 2.7 m	Acid-fast, painted in red	Spores, painted in bright red color. Vegetative cells painted over in blue
Serratia sp. 10 (S-8)	T-short rods and cocci, 1x2 m	Acid-resistant, painted in red color	No controversy, only vegetative cells painted in blue color
Arhtrobacter sp. 13(P-7)	T + sticks, 0.6 x3, 5 microns	Acid-resistant, painted in red color	Spores, painted in bright red color
Bacillus sp. 27 (B-4)	T + large sticks, 1,2 x 4 m	Acid-resistant, painted in red color	Spores, painted in bright red color

A result of research noted that the 3 strains are spore-forming rods + T (table 2). All test strains are aerobic and one can assume that the 3 strains belong to the group of Gram-positive rods, endospore forming the genus *Bacillus*. Furthermore, the strain *Serratia* sp. 10 (S-8) and does not form a acid-enodospor strain.

Thus, as a result of studying the cultural-morphological properties of pure cultures found that 3 strains (B-1, B-4, F-7) is identified as the genus *Bacillus*, a strain of S-8 belongs to the expectation number Bergey's Manual of Determinative Bacteriology 4 gram-negative aerobic / microaerophilic rods and cocci.

Study of the biochemical properties of pure cultures of the following results. Assimilation of different carbohydrates by pure cultures as a result of crop on semi-solid medium Hiss presented in (table-3).

Table 3 - The ability of pure cultures of fermentable carbohydrates

carbohydrate	B-1	B-4	P-7	S-8
arabinose	++	+	++	+++
xylose	++	+++	++	+++
glucose	+++	+++	+++	+++
levulose	++	++	+++	-
galactose	+++	+++	+++	+++
saccharose	+++	+++	+++	-
maltose	+++	+++	+++	-
lactose	++	+	++	++
dextrin	++	+	+	+
starch	++	++	++	+

cellulose	+	-	-	-
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"+++" Strong, "++" Medium, "+" weak intensity bacterial growth, "-" no growth of bacteria

As a result of studies on the ability of the strains for fermentation of carbohydrate with "mottled number" indicated that all tested strains actively use glucose and galactose. Strains B-1, B-4, F-7 is also active against sucrose and maltose. The average intensity of the use of these strains is characteristic of carbohydrates arabinose, levulose, lactose and starch. Low activity splitting characterized dextrin. It has been established that fiber is not cleaved strains B-4 and R-7. For strain S-8 also characterized by intensive use of arabinose and xylose carbohydrates, less widely used lactose. Weak growth rate on media marked with dextrin and starch, and levulose, maltose, sucrose and cellulose does not cleave this strain (Table 3).

The results of the study of the proteolytic activity, the ability to form ammonia, hydrogen sulfide and indole are shown in (table 4).

Table 4 - The ability of the strains to the formation of a protease, ammonia, hydrogen sulfide and indole

property	B-1	B-4	P-7	S-8
protease Activity	+	+	+	-
the formation of ammonia	+	+	+	+
formation of indole	-	-	-	-
formation of hydrogen sulfide	+	-	+	-
Attitude to oxidase	+	+	+	+
catalase	+	+	+	+

"+" - The bacterial strain showing the property, "-" - no part of the properties of the strain.

The study showed found that strains B-1, B-4, R-7, showing the ability to synthesize proteases formation of ammonia, oxidase and catalase do not form indole. Strains B1 and R 7 are capable of forming hydrogen sulphide, the strains B-4 S-8, and do not form hydrogen sulfide. Strain S-8 is able to form ammonia, catalase and oxidase positive, the protease does not produce hydrogen sulfide and indole.

For genetic identification of pure cultures were sent to the "State Research Institute of Genetics" (Moscow, Russian Federation), where strains were performed primary screening studies to identify pathogenic, opportunistic and pathogenic species. As a result of primary screening of the strains B-1 and B-4 are related to an *Bacillus cereus*. This kind of relates to microorganisms pathogenic microflora capable of causing foodborne diseases, produce enterotoxins. This type of bacteria is not used in the composition of biologics without additional toxicity studies strains and their metabolites in warm-blooded animals. Accordingly, these strains for further studies can not be used and their sequencing was conducted.

During the sequencing of variable regions of 16S rRNA strains R-7 and S-8 nucleotide sequences obtained for both strains.

As a result, primary screening nucleotide sequence of strain R-7 on the GenBank database, and RDP-II found that the investigated strain belongs to the following taxonomic groups of Bacteria; Firmicutes; Bacilli; Bacillales; Bacillaceae; *Bacillus*, and homology with some species of the genus *Bacillus* is 98%.

Sequences were aligned with the corresponding sequences of a species of bacteria nearest available from the database GenBank.

According to the analysis of phylogenetic tree was constructed with homologous strains Fig.1.

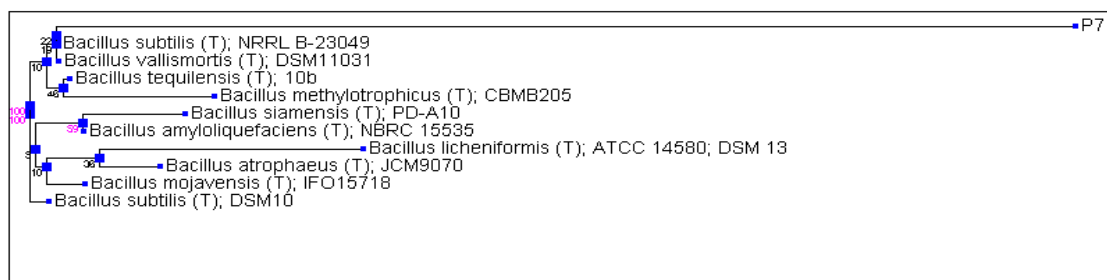


Figure 1. Phylogenetic position of strain R-7

Criterion for classifying a microorganism to a particular type of homology is considered no less than 97%. By this criterion, the test strains can be attributed to several species of the genus *Bacillus*.

Analysis of phylogenetic relationships, built using the type strains of closely related bacteria showed that the closest to the test strain is the type *Bacillus subtilis*. The level of 16S rRNA sequence similarity of strain R-7 with a view *Bacillus subtilis* was 97%.

As a result, primary screening nucleotide sequence of strain S-8 to the GenBank database, and RDP-II found that the investigated strain belongs to the following taxonomic groups of Bacteria; Proteobacteria; Gammaproteobacteria; Pseudomonadales; Moraxellaceae; *Acinetobacter*.

Sequences were aligned with the corresponding sequences of a species of bacteria nearest available from the database GenBank.

According to the analysis of phylogenetic tree was constructed with homologous strains Fig. 2

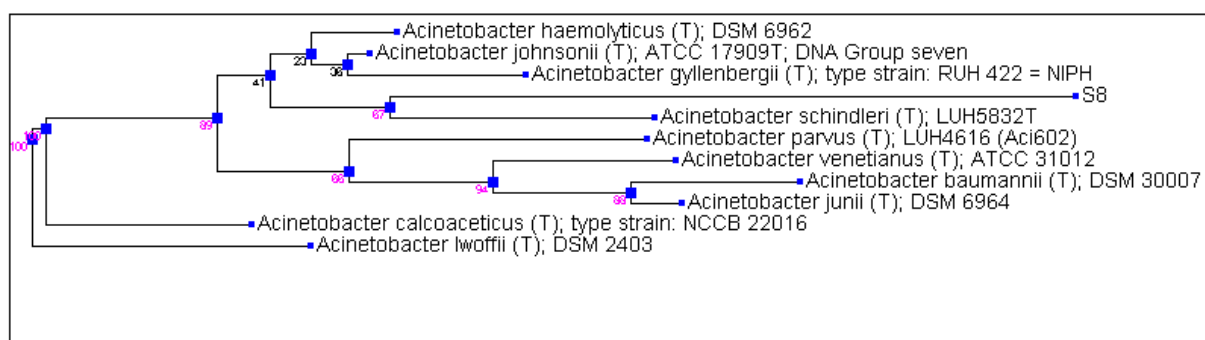


Figure 2. Phylogenetic position of strain S-8

Criterion for classifying a microorganism to a particular type of homology is considered no less than 97%. By this criterion, the test strains can be attributed to several species of the genus *Acinetobacter*.

Analysis of phylogenetic relationships, built using the type strains of closely related bacteria showed that the closest to the test strain is the kind of *Acinetobacter johnsonii*. The level of 16S rRNA sequence similarity of the strain S-8 overlooking *Acinetobacter johnsonii* was 98%.

The analysis Sequence variable regions of genes encoding 16S rRNA for further work to study the ability of the strains to oil degradation are 2 strain: *Bacillus subtilis* and *Acinetobacter johnsonii*.

CONCLUSION

As a result, the primary screen to identify accessory to pathogenic strains, pathogenic and pathogenic microflora found that strains of B-1 and B-4 are members of the species *Bacillus cereus*.

These representatives were opportunistic and therefore can not be used as a basis for a biological product.

Strains R-7 and S-8 were subjected Sequence analysis of variable regions of the genes encoding 16S rRNA. As a result of this study showed that the strain F-7 97% is representative of species *Bacillus subtilis*, a strain of S-8 98% is representative species *Acinetobacter johnsonii*.

For these strains are written passports for national deposit procedures. In addition, these strains will be used to create a domestic biological product.

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Rezyume: Hozirgi vaqtda neft uglevodorodlarining Kaspiy dengizi hududiga salbiy ta'siri muammosi halokatli tus oldi. Uglevodorod xomashyosini qazib olish, tashish va saqlash natijasida dengiz hududlarining neft va neft mahsulotlari bilan intensiv ifloslanishi dengiz ekotizimining buzilishiga olib keladi. Dengiz muhitini tozalashning mexanik va fizik-kimyoviy usullari past samaradorlik, ikkilamchi ifloslanish va yuqori narx bilan tavsiflanadi. Eng istiqbolli - suv zonalarini neft bilan ifloslanishdan tozalash uchun mikrobiologik usullardan foydalanish. Maqolada neftning ifloslanishiga qarshi yangi biopreparatda foydalanish uchun Kaspiy dengizining dengiz muhitidan ajratilgan neft oksidlovchi bakteriyalarning faol shakllarini aniqlash natijalari keltirilgan.

Aqtau dengiz porti va Bautino portining (Shimoliy Kaspiy dengizi) yuklash to'xtash joylari hududida dengiz suvlaridan neftni yo'q qilish qobiliyatiga ega bo'lgan mikroorganizmlarning 27 ta uglevodorod oksidlovchi izolatlari ajratilgan, ulardan 4 ta eng faol kulturalar tanlangan. shtammlari, ular *Bacillus cereus* (2 shtam), *Bacillus sp.13* va *Acinetobacter sp.10* shtammi sifatida aniqlangan.

Резюме: В настоящее время проблема негативного воздействия нефтяных углеводородов на территории Каспийского моря приобрела катастрофический характер. Интенсивное загрязнение морских акваторий нефтью и нефтепродуктами в результате добычи, транспортировки и хранения углеводородного сырья приводят к угнетению экосистемы моря. Механические и физико-химические методы очистки морской среды характеризуются низкой эффективностью, вторичным загрязнением и дороговизной. Наиболее перспективным является использование микробиологических методов очистки акваторий от нефтяных загрязнений. В статье представлены результаты идентификации

активных форм нефтеокисляющих бактерий, выделенных из морской среды Каспия, для дальнейшего их использования в новом биопрепарате от нефтяных загрязнений.

Из морских вод в районе наливных причалов Актауского морского порта и порта Баутино (Северный Каспий) выделено 27 углеводородокисляющих изолятов микроорганизмов, обладающих способностью к деградации нефти, из данных штаммов отобрано 4 наиболее активные культуры, которые были идентифицированы как *Bacillus cereus* (2 штамма), штамм *Bacillus sp.13* и *Acinetobacter sp.10*.

Kalit so'zlar: identifikatsiya, morfologik, madaniy va biokimyoviy xossalari, neft destruktorlari, sekvensiya, toza kulturalar.

Ключевые слова: идентификация, морфолого-культуральные и биохимические свойства, нефтедеструкторы, секвенирование, чистые культуры.

UDC 502.057

ECOLOGICAL ASSESSMENT OF SOILS ON THE SITES OF SHIPYARD CONSTRUCTION IN THE AREA OF V. KURYK

Koybakova S.E.¹, Allamuratov M.O.², Khabibullaev A. J.², Alimbetov A.A.²,
Abdimuratova N.K.²

¹*Caspian State University of Technologies and Engineering named after Sh. Esenov,*

²*Karakalpak State University named of Berdakh.*

Summary: *The article studies the state of soils during the construction of the shipyard at two sites, but site No. 2 is of greater interest to us. The data obtained as a result of the research can serve as a basis for further research and monitoring of the environment in the areas of oil fields located in the coastal zone of the Caspian Sea.*

Key words: *Caspian sea, coast, ecological assessment, monitoring, heavy metals, oil products.*

INTRODUCTION

The issues of environmental protection and ensuring the ecological safety of the Caspian Sea and its coastal zones are reflected in the main directions of the economic and social development of the Republic of Kazakhstan for the period up to 2050 [1]. The Mangistau region is one of the hydrocarbon production areas, where large both offshore and onshore oil fields are concentrated. The prospects for the development of a system for transporting crude oil by sea have led to the need to forecast new shipbuilding facilities needed for the construction of new ships. The most preferred site, on the recommendation of KazMunayGas JSC, was the coastal part of the Kuryk settlement as the third base for marine operations along with the ports of Bautino and Aktau [2].

In the feasibility study of the shipbuilding and ship repair plant in the village of Kuryk, the following were considered (Figure 1):

- area 1, located approximately at a distance of 2.5 km from the village of Kuryk, in the area of the Ersai shipyard, in particular ERSAl Caspian Contractor LLP (ERSAI LLC);
- area 2, located at a distance of about 12.5 km from the village of Kuryk.

According to the results of studies of the planned sites for the construction of the shipyard, the specialists of the Center for Remote Sensing and GIS "Terra" LLP made the following conclusions [3]. So, from an environmental point of view, one can give preference to site No. 1, the development of which will cause less damage to the wildlife compared to the arrangement of site No. 2. But, it must be taken into account that site No. 1 is located near the Ersai shipyard. This can undoubtedly lead to increased stresses on the components of the environment due to cumulative impacts.



Fig.1 Scheme of the planned construction sites of the shipyard in the v. of Kuryk

We are studying the state of soils during the construction of the shipyard at two sites, but site No. 2 is of greater interest to us. The data obtained as a result of the research can serve as a basis for further research and monitoring of the environment in the areas of oil fields located in the coastal zone of the Caspian Sea.

The area under consideration belongs to the middle desert of Mangyshlak. According to [3,4,5], middle deserts are common in most of the Mangistau region. They differ in that their information composition is more diverse than in the southern deserts.

Materials and research methods. The main source of factual information is the materials of our own field research conducted on March 9 and 10, 2018 with specialists from the Ecology Department of the Regional Department of Natural Resources and Environmental Management of the Mangystau Region.

Monitoring observations were carried out in accordance with generally accepted methods, taking into account the experience of carrying out similar work in the coastal zone of the Caspian Sea. The envelope method was used for sampling. Sampling methodology for monitoring general local soil pollution complies with GOST 17.4.3.01.-83; GOST 17.4.4.02-84 [6.7].

Soil samples were analyzed in an accredited environmental laboratory Department of Natural Resources and Environmental Management, which used the following measurement methods, M03-03-2012 (kz.07.00.01668-2013) and MVI 20658-1917. Schemes - maps of research areas and sampling were made using GIS.

Research results and discussion. The heterogeneity of the soil cover of the study area is due both to the nature of the relief and parent rocks, and to the different conditions of soil formation on the coast of the Caspian Sea [8,9]. According to the soil and geographical characteristics, the described area, as noted above in the text, is located in the desert zone and belongs to the middle desert (Fig. 2) with a predominance of brown soils [4, 10, 12].

Soil cover of site No. 1. Plot No. 1 is located at a distance of 1.5 km from the village of Kuryk and its soils of varying degrees of salinity and anthropogenic disturbance.

The territory is a narrow seaside strip with sandy-shell rock saline sediments, which are replaced by sandy-saline soils [8,9].

The date of soil sampling at point 1 of plot No. 1 was made on 03.09.2018.

Point 1 was laid 10 m from the sea coast within the distribution of coastal marsh solonchaks with annual saltwort vegetation (Figure 1). The content of heavy metals (HM) and oil products (OP) in soil samples is shown in Table 1 and Figure 3.

Table 1 - Indicators of the degree of soil contamination with HM and OP (section No. 1, point 1)

Point 1)											
№	Coordinates sampling sites	Depth, cm	OP	Heavy metals mg/kg							
				Cu	Zn	Ni	Co	Cr	Fe	Pb	
				mg/ kg	mg/ kg	mg/ kg	mg/ kg	mg/ kg	mg/ kg	mg/ kg	
1	N43°11'01,8" E	0-5	< 0,5	1,05	6,15	1,20	0,31	0,35	0,73	3,84	
		5-20	< 0,5	1,32	7,51	1,84	0,48	0,27	0,23	2,73	
MPC mg/kg			1000	3,0	23,0	4,0	6,0	0,05	background	32,0	

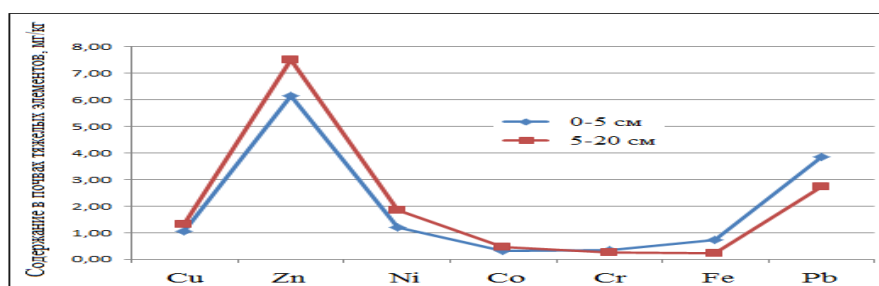


Figure. 3 The content of petroleum products and heavy metals at point 1, section No. 1.

The results of the analysis of soil samples show that the content of Cu, Pb, Ni, Fe, Co, Cr is much less than the MPC. Their presence in soil samples is explained by their contamination with sediments from a flooded barge located 25 meters away.

As for zinc Zn, this can be explained by the fact that usually soil-forming rocks, in particular coastal soils, depending on their granulometric composition, on average contain from 30.6 to 71.7 mg/kg.

The highest average values of zinc are typical for solonchaks [10].

Point 2. Date of sampling 09.03.2018. At this point, sandy-saline soils are rudimentary soil formations, the formation of which is associated with the initial phase of the development of soil-forming processes.

Sandy-saline soils of the seaside strip are formed at a close occurrence to the surface (1-1.5 m) of highly mineralized groundwater and are characterized by a moist, stratified, saline, variegated profile with signs of gleying from a depth of 20-30 cm.

Projective cover - up to 30%. These are the youngest soil formations, which have a small amount of humus (0.05-0.1%) in the surface horizon.

The content of heavy metals and oil products in soil samples is shown in Table 2 and Figure 4.

Table 2 - Indicators of the degree of soil contamination with HM and OP (point 2, plot No. 1)

№	Coordinates sampling sites	Depth, cm	OP	Heavy metals mg/kg						
				Cu	Zn	Ni	Co	Cr	Fe	Pb
				mg/kg	mg/k g	mg/kg	mg/k g	mg/k g	mg/kg	mg/k g
1	N43°11'03,40"E51°	0-5	< 0,5	4,88	13,2	7,92	2,51	0,62	0,81	2,93
		5-20	< 0,5	4,31	14,2	8,11	3,61	0,41	0,73	2,17
ПДК мг/кг			1000	3,0	23,0	4,0	6,0	0,05	backgro	32,0

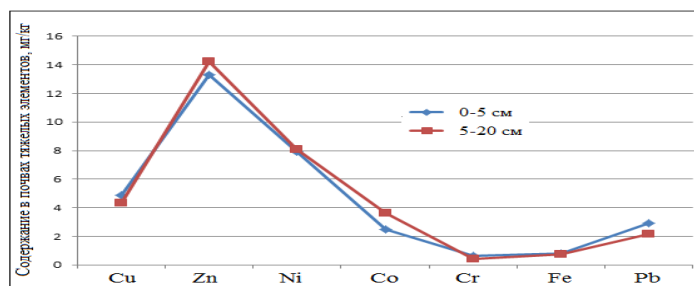


Fig. 4 The content of petroleum products and heavy metals at point 2, area number 1.

The content of zinc Zn in soil samples, within 0.7 MPC, at this point can be explained by the presence in this area, not far from Ersai LLP, of waste from the metallurgical industry and heavy traffic. Exceeding the nickel content of more than 2 MPC in the soil of point 2 is explained by the fact that the concentration of nickel in sandy soils can be 8-15 mg/kg, in addition, there are a lot of empty paint cans in the waste. The high content of copper Cu, 1.6 MPC in a layer of 0-5 cm, and 1.4 MPC in a layer of 5-20 cm, as well as chromium Cr more than 3 MPC is explained by the storage of industrial waste and welding slag near this point. Cobalt Co is one of the trace elements of fertilizers and in small (as in point 1) concentrations is necessary for the development of plants, in particular, to increase drought resistance.

Soil cover of site No. 2. The soil cover of site No. 2, located at a distance of about 15 km from the village of Kuryk, is represented by saline coastal sands, occupying elevated areas of the terrain, sandy-saline soils, the formation of which is associated with the initial phase of the development of soil-forming processes.

Point 1. Date of sampling 03/09/2018. The soil cover of the described point is represented by saline coastal sands. The sands have a layered profile in terms of mechanical composition with numerous inclusions of shell rock - up to 95-100%. The humus content in the upper layer is insignificant and decreases with depth. The content of heavy metals and NPs in soil samples is shown in Table 3 and Figure 5.

At this research site, in the northern part of the ferry complex under construction and at a distance of 13 km from the village of Kuryk, as expected, no excesses of the MPC for oil products and heavy metals, except for Cr chromium, were recorded. The excess of the content of chromium in the sample of point 1 of the MPC by 2.03 times can be explained by a certain elevation of point 1, which causes the accumulation of microelements during dust storms. In addition, the soil sampling site is located 25-30 meters from the parking lot for the transportation of chrome products for construction needs. Also next to the parking lot there is a container with dishes from paints, from which chromium leaching is possible.

Table 3 - Indicators of the degree of soil contamination with HM and NP (point 1, area No. 2)

№	Coordinates sampling sites	Depth, cm	OP	Heavy metals mg/kg						
				Cu	Zn	Ni	Co	Cr	Fe	Pb
				mg/k g	mg/kg	mg/k g	mg/kg	mg/k g	mg/k g	mg/kg
1	N 43°10'0,41" E 51°26'9,97"	0-5	< 0,5	0,97	3,06	0,014	1,22	0,107	0,63	3,06
		5-20	< 0,5	0,31	1,83	0,005	0,93	0,072	0,33	1,79
ПДК мг/кг			1000	3,0	23,0	4,0	6,0	0,05	backgr	32,0

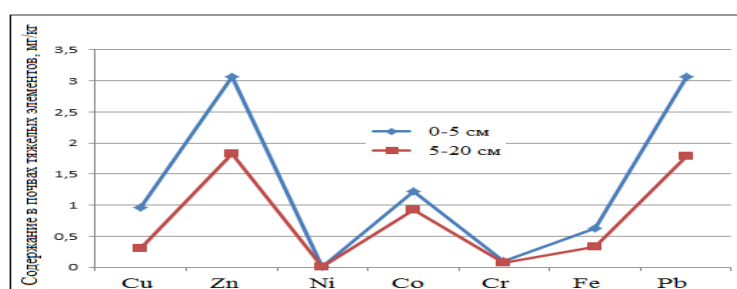


Fig. 5 The content of petroleum products and heavy metals at point 1, area number 2.

Point 2. Sampling date March 10, 2018. The soil cover of point 2 is similar to point 1 and is represented by saline coastal sands. The content of heavy metals and oil products in soil samples is shown in Table 4 and Figure 6.

Table 4 - Indicators of the degree of soil contamination with HM and NP (point 2, site No. 2)

№	Coordinates sampling sites	Depth, cm	OP	Heavy metals mg/kg						
				Cu	Zn	Ni	Co	Cr	Fe	Pb
				mg/k g	mg/k g	mg/k g	mg/kg	mg/kg	mg/kg	mg/kg
1	N 43°10'3,20"E51°	0-5	< 0,5	1,2	2,14	3,16	0,51	0,431	1,97	3,17
		5-20	< 0,5	0,7	1,84	2,97	0,07	0,22	0,38	2,33
ПДК мг/кг			1000	3,0	23,0	4,0	6,0	0,05	backrou	32,0

The excess of the content in the samples of point 2 of the site Cr chromium by 4.07 times the MPC is explained by the emissions of the concrete unit, which is located above point 2. The concrete unit provides the construction of the breakwater with hydraulic concrete.

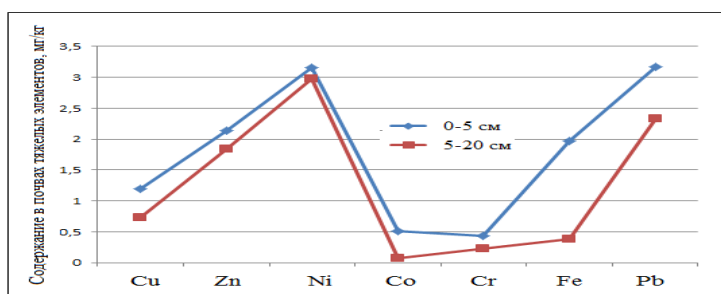


Fig. 6 The content of petroleum products and heavy metals at point 2, area number 2.

Using Mapinfo Professional v.10.2, SAS. Planet 160707, maps were made of the location of sampling points in sites No. 1 and No. 2 (Figure 9) depicting soils and vegetation.

CONCLUSION

It has been established that on site No. 2, belonging to the middle desert of the region, the vegetation cover was created by a community of formations consisting mainly of wormwood (5 formations), biyurgun, sakchaul, black boyalich and juicy perennial saltwort, which is more of the same diversity than in the southern deserts twice.

It has been established that the lands of this site are mainly occupied by peasant farms, for growing vegetables in the open field and fruit trees. Irrigation is provided by groundwater from wells with a depth of about 50 meters, with a mineralization of 3-4 g/dm³. They are distinguished by a high content of nitrates and nitrites (up to 144 mg/dm³). At Cape Peschanoy (Fig. 2), there were previously 9 production wells drilled to a depth of 15 meters in the sands of the Khvalyn terrace and Pontian limestones. Thus, for the development of plants growing in this area, it is necessary to develop measures for the construction of desalination plants to irrigate existing and future lands for agriculture.

Recently, their projective cover has decreased to 12-15%. This is due to natural factors, but there is also an anthropogenic impact on vegetation due to man-made disturbance of land by earthworks and traffic. Dusting can cause blockage of the stomatal apparatus in plants and disruption of their vital activity at the physiological and biochemical levels. Chemical pollution of the vegetation cover is associated with emissions of toxic substances from exhaust gases, and leaks of fuel and lubricants.



Fig. 9 Map-scheme of monitoring points on the site No. 1 and No. 2.

It has been established that the average degree of soil pollution, according to the results of analyzes of soil samples at point 2, site No. 1, located within the working area of Ersai LLP, in our opinion, is created by two elements Ni nickel and Cr chromium. Exceeding the MPC for mobile forms of zinc (Zn) at all sampling points. Based on the results of all seven heavy metals analyzed, it was found that the light contamination at site #1 was most likely created by the five elements Zn zinc, Cu copper, Co cobalt, Ni nickel and Fe iron. In the samples of the two studied sites, the most dangerous heavy metals such as Hg mercury and As arsenic were not found. It has been established that a significant impact on the vegetation cover of the territory of solid domestic waste, as well as spontaneous unauthorized dumps directly on the coast of the Caspian Sea.

It has been established that studies are needed to assess the impact on soils in the area of

shipyard construction and to compile a database of vegetation biodiversity to predict changes in vegetation communities and the state of environmental components [11]. Only compliance with the existing requirements for the cleanup of the territory after construction work, and measures for the reclamation of disturbed lands will preserve the naturalness of the soil and vegetation [10,11].

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Rezyume: Maqolada ikkita uchastkadagi kemasozlik qurilishi paytidagi tuproqlarning holati o'rganiladi, ammo 2-sonli uchastka bizni ko'proq qiziqtiradi. Tadqiqotlar natijasida olingan ma'lumotlar Kaspiy dengizining qirg'oq zonasida joylashgan neft konlari hududlarida atrof-muhitni keyingi tadqiq qilish va monitoring qilish uchun asos bo'lib xizmat qilishi mumkin.

Резюме: В статье изучается состояние почв в период строительства судовой на двух участках, но больший интерес для нас представляет участок №2. Полученные в результате исследований данные, могут служить основой для дальнейших исследований и контроля за окружающей средой в районах нефтяных месторождений размещенных в прибрежной зоне Каспия.

Kalit so'zlar: Kaspiy, qirg'oq, atrof-muhitni baholash, monitoring, og'ir metallar, neft mahsulotlari.

Ключевые слова: Каспий, побережье, экологическая оценка, мониторинг, тяжелые металлы, нефтепродукты

УДК 621.313

PROSPECTS FOR THE DEVELOPMENT OF WIND POWER IN THE REPUBLIC OF UZBEKISTAN

Reymov K.M.

Karakalpak State University named after Berdakh

Summary: The article presents the results of the first project to analyze the possibilities of large-scale inclusion of Uzbekistan's wind energy in electricity generation. Previously, such extensive work has not been carried out in this area, assessments of wind resources at general and estimated levels were carried out in order to use the results for the design of wind parks in separate two sites.

Key words: wind energy, electric generator, wind potential, region, analysis.

The Republic of Uzbekistan has very good wind resources, suitable for the viable development of large scale commercial wind farms. The regions with the highest wind potential are in the mountain region North-East of Tashkent, the mountain range South and East of Samarkand, and the mountain range between the Jizzax and the Samarkand region [1-6]. The regions with the second highest wind potentials can be found in the Navoiy and Karakalpakstan region (fig. 1).

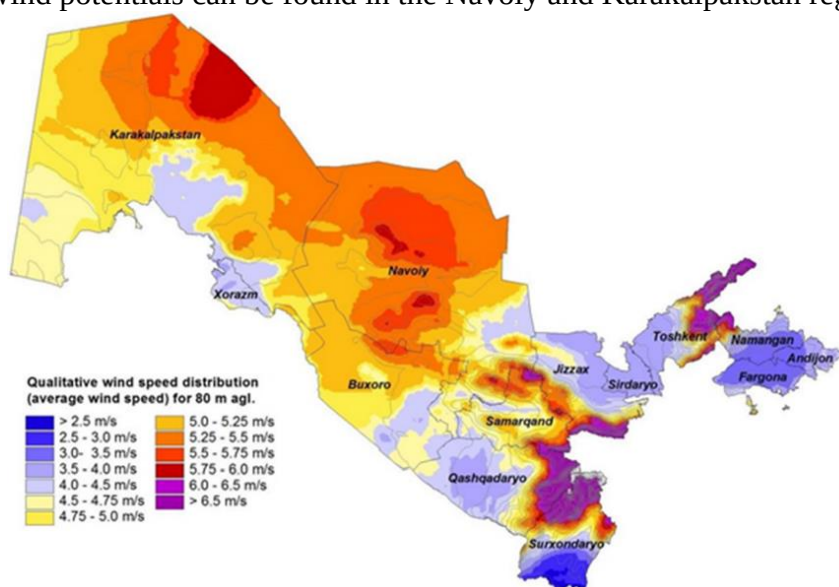


Figure 1. Wind Atlas of the Republic of Uzbekistan.

A standard wind measurement campaign was conducted at each site, collecting data over the required 12-month period. High data quality requires a preliminary assessment of the results of wind resources for each site.

The 12 months measured mean average annual wind speed for both sites are:

- Nukus: 7.7 m/s at 85m. (Measurement Period: 04/2015 – 04/2016)
- Zarafshon: 7.9 m/s at 85m (Measurement Period: 04/2015 – 04/2016)

The long term correlated wind speed (1980-2015) for both sites are:

- Nukus: 7.8 m/s at 85m (MERRA analysis)
- Zarafshon: 8.2 m/s at 85m (MERRA analysis)

In the next step of this analysis the annual energy yield for a specific wind turbine model

was calculated. The wind conditions on the turbine locations might be different from those measured at the met mast. In order to simulate wind conditions on each turbine location, a wind flow model is used.

The selection of the best fitting wind turbine is depending on many factors such as the wind conditions on site, which cause loads on the structure of the turbine and have a strong influence on the generated electricity as well as the transportation and installation of the wind turbines and costs associated with it. Wind turbines are available from many manufacturers worldwide with various specifications to fulfil a huge number of different requirements in existing and planned projects. Current industry standard are turbines with 100 m rotor, 3 MW Generator and 100 m hub height.

Table 1, shows the long term correlated annual energy yield results for a Siemens SWT-3.0-101 wind turbine (3 MW, 101m Rotor, 94 m Hub Height), as an example for an industry standard turbine that is available in Uzbekistan.

Table 1. Overview about the two wind parks.

Location	Annual Energy Yield (MWh/year)*	No. of Turbines	Total installed capacity (MW)
Nukus	326,812	34	102
Zarafshon	357,746	34	102

*Gross energy yield. Only wind farm wake losses (4.7% for Nukus and 6.9% for Zarafshon) included. P50 value.

Details about the electrical layout and the geotechnical consideration for both sites are presented further in other sections of this report. Further some initial transportation considerations are presented as well as a brief overview of the Uzbekistan market environment. In order to consider local assembly of wind turbine components or national manufacturing a minimum of 1000 MW of committed wind turbine capacity should be present,

Environmental Impact Assessments have been carried out for the two sites. The results showed no negative impact if certain mitigation measures, such as dust control during construction and others during the implementation are taken. The Nukus and Zarafshon wind power plants will contribute in diversifying electricity generation mix, and reduce the dependence on gas. Further, it constitutes an entry point to the up-scale of wind energy technology. This will contribute in meeting the rising demand on power due to economic development and preserve environment, protect the climate and reduce the environmental impact of the power sector.

A wind turbine is designated by its nominal power: the maximum power generated by the machine at design wind speed which usually is above the average wind speed on site. Wind turbines, however, produce a range of power between the cut in wind speed, (the wind speed at which the turbine begins to generate power) and the rated wind speed, (the wind speed at which the nominal power of the turbine is achieved). The nominal output voltage of each electrical wind generator will be three-phase, 690 volts, at a frequency of 50 Hz. The wind energy conversion system consists of the following components:

- **Tower:** The tower is intended to support the turbines, controllers and the generator. The tower will be anchored to a base foundation. The tapered tubular steel tower will stand self-supporting without any guy wires or other types of support.
- **Nacelle:** The nacelle is the unit sitting on top of the tower that connects to the turbine hub and blades and houses the gear box and generator. The nacelle is designed to rotate to orient the blades into the direction of the wind to ensure maximum electric output
- **Rotor:** Three blades connected at a single hub are mounted to one end of the nacelle. The orientation of the blades is automatically changed according to the wind direction using a pitch controller.

- **Generator:** A fully enclosed synchronous generator with permanent magnet excitation is mounted in the nacelle, as well. For the foreseen turbine type, the voltage output of the generator will be 690 V.

- **Protection, Metering and Telemetry:** Each point of connection of wind turbine requires equipment for system protection, metering and telemetry. At a minimum each point of connection shall have disconnection switch and circuit breakers. Relays are needed to control the tripping of circuit breakers in the event of faults, or out of step that the wind generator might experience.

- **SVC or Shunt Capacitors Banks:** Because of the intermittent nature of wind, the power produced by the wind turbine generator is fluctuating. Most of the time, the produced power often shows a huge share of reactive power ($\cos\phi$ being around 0.85, called a low power factor). In order to rectify the power factor towards unity, static var controllers (SVC) or fixed capacitor units are used.

- **Diesel Generator:** There is permanent need for all auxiliary power consumers like marking and lighting system, SCADA system, security system etc. A diesel generator is installed to ensure permanent power supply to devices.

Wind power integration into the existing power system is essential to analyze in detail in an early phase when designing a wind farm. It is done by using programs that analyze power system dynamics. The integration of wind farms has influence on the transmission system. The fluctuating and uncontrollable energy production that characterizes wind farms needs to be dealt with in the power system they connect to and it becomes more important with increasing amount of integrated wind power. Because of fluctuating nature of wind power a larger generation reserve in the grid system is needed in case the wind doesn't blow to maintain system capacity. It is estimated that if wind power accounts for 10% of the total energy production in a system, it requires an extra reserve corresponding to 2- 10% of the installed wind power capacity. With decreasing wind power proportion less reserve is needed.

Wind turbines interfere with the system they connect to in a number of ways. In the past problems related to integration of wind power, were substantial but technological advances have diminished them substantially. The main challenges are related to power peaks, the generation of reactive power, electrical flicker, causation of harmonics and switching operations.

Power peaks occur with sudden changes in the turbines output. For example, this could happen during a sudden increase in wind speed. In modern variable speed turbines with better control over the power output of the inverter system using a control mechanisms this effect has been minimized. Also building a wind farm with many turbines adds a smoothing effect to this phenomenon as the occurrence of a sudden increase in wind generally does not happen at exactly the same time at all turbines.

Advanced power electronic equipment in modern wind turbines can control both the capacitive and inductive reactive power of the turbines thereby keeping the voltage level delivered to the grid stable. This feature of wind turbines can even be used to increase power quality at weak points of the power grid.

Sudden changes in the turbines active and reactive power output causes electrical flickers and these still occur with modern turbines. As technology has advanced in giving better control over active power peaks and reactive power the flickers has decreased. Even the number of turbines within a wind park or an area under review gives a smoothing effect to the occurrence of flickers.

The drawback with the power electronic equipment in modern turbines is its tendency to produce harmonic currents in the system. The turbine transformer reduces this effect: filters are used with the same purpose.

In-rush currents and changes in active and reactive power associated with the turbines switching operations can cause voltage changes in the output. Newer technology has decreased this problem.

Reactive power is used to compensate the voltage drops using transformer taps and voltage regulators.

Active power is the power supplied into the grid. Frequency control refers to the need to ensure that the grid frequency stays within a specific range of the nominal frequency. Mismatch between electricity demand and generation causes variations in frequency and control services are required to bring the frequency back to its nominal value and ensure it does not vary out of range defined by the Transmission System Operator. Wind turbines with variable-speed generators have the potential to add inertia to the grid and assist in frequency control.

An operating reserve is a generator that can quickly be dispatched to ensure that there is sufficient energy generation to meet load. Spinning reserves are generators that are already online and can rapidly increase their power output to meet fast changes in demand. Spinning reserves are required because demand can vary on short timescales and rapid response is needed. Other operating reserves are generators that can be dispatched by the operator to meet demand, but that cannot respond as quickly as spinning reserves. Many of the operating reserves are traditionally provided by spinning generators and voltage regulators.

“Fault-ride through” refers to the operation of the generating system when there is a voltage drop on the supply network. In most cases it is safe to simply disconnect a wind turbine if the grid voltage drops below a specified level. However, often this may exacerbate the problem and it is preferable for the generators to ride through the fault and continue to provide power to the system.

The mentioned parameters have to fulfill the quality, reliability and safety levels required by the Transmission System Operator.

Conclusion

Combining the above it has been concluded that modern technology in wind turbines design and construction has decreased problems regarding power quality to such a level that the power system is no longer threatened by the expansion of wind energy.

Parameters to be considered in order to obtain a satisfactory integration of wind power generation into the electrical grid are:

- reactive power and voltage control,
- active power and frequency control,
- operating reserves, and
- fault ride-through.

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Rezyume: Maqolada O'zbekiston shamol energetikasida elektr energiyasi ishlab chiqarishda keng ko'lamli ishlar imkoniyatlarini tahlil qilish bo'yicha birinchi loyiha natijalari keltirilgan. Ilgari bu sohada bunday keng ko'lamli ishlar amalga oshirilmagan, olingan natijalardan ikkita alohida hududda shamol parklarini loyihalashda foydalanish uchun shamol resurslarini umumiy va taxminiy darajalarda baholash amalga oshirilgan.

Резюме: В статье рассматриваются результаты первого проекта по анализу возможностей масштабного включения ветроэнергетики Узбекистана в генерацию электроэнергии. Поскольку ранее в этой области не проводилось столь интенсивной работы, были проведены оценка ветровых ресурсов на общем и конкретном уровне, чтобы использовать результаты для предварительного проектирования ветровых парков на двух конкретных участках.

Kalit so'zlar: shamol energiyasi, elektr generatori, shamol salohiyati, hudud, tahlil.

Ключевые слова: энергия ветра, электрический генератор, потенциал ветра, регион, анализ.

УДК 621.313

STUDY AND ANALYSIS OF THE HEAT EXCHANGE PROCESS OF REGENERATIVE AIR HEATER OF TAKHIATASH TPP (TERMAL PAWER PLANT)

Babakhodjaev R. P.¹, Kurbanbaeva Z. Kh.¹, Shoydiev K. A.², Uzaqbaev Q. A.³

¹Tashkent State Technical University named after Islam Karimov, ²Karakalpaksky institute selskohozyaystvennoy agrotechniki, ³Karakalpak state University named after Berdakh

Summary: The article presents the main parameters of the regenerative air heater of the Takhiatash thermal power plant (TPP) and the results of heat exchange calculation of the hot surface.

Key words: regenerative air heater, hot heat carrier, cold heat carrier, temperature difference, inlet gas temperature.

Introduction

The installed capacity of Uzbekistan's energy system is more than 12,000 MW, and about 90% of it is produced in thermal power plants (TPP). Modernization of the energy system of Uzbekistan through the introduction of new energy-efficient units based on combined gas turbine units is a timely and necessary measure, which allows to solve the problem of increasing the efficiency of fuel and energy resource use to a certain extent. At the same time, relatively new energy units, for example, two 230-280 MW steam gas units of Takhyatash TPP, will be put into operation in the short and medium term. from the point of view of efficient use of fuel and energy resources, the operation of the republic's thermal power plants cannot be considered satisfactory.

Problem statement

One of the ways to improve the efficiency of a steam turbine unit is usually achieved by reducing the temperature of the flue gases to the boiler, i.e. by increasing the heat exchange between the air heater [1-3]. A long-term analysis of the efficiency of the plant's energy units shows that the lack of combustion air in boiler units is one of the problematic areas today.

Problem solving method

In order to solve this problem, it is necessary to research regenerative air heaters. Also, the lack of heated air leads to a decrease in the power of the device and a decrease in work efficiency due to the consumption of excess electricity for the boiler's needs [2-4]. For this reason, in order to research the regenerative air heater and increase its efficiency, the RAH-68m regenerative air heater installed in the power units of Takhiatash TPP was taken. The main performance of the Takiatash TPP RAH-68m regenerative air heater is given below.

1. Boiler type TGME-206
2. RVP type RAH-68m
3. Total height of the hot layer, [mm] 1200
4. Total height of the cold part, [mm] 600
5. Heating surface of the hot part, [mm²] 13550
6. Heating surface of the cold part, [mm²] 4450
7. Fuel consumption, [kg/s] 54000
8. Gas temperature at the RAH inlet, [°C] 415
9. Air temperature at the RAH inlet, [°C] 30
10. Gas temperature at the RAH outlet, [°C] 122
12. Air temperature at the RAH outlet, [°C] 140

Knowing the above parameters, we determine the heat calculation of the device as follows.
Thermal calculation of regenerative air heater

Air outlet temperature. $t_{gy} = 140$ [°C]

The enthalpy of air at the exit I_0 is 1300 [kcal/kg]

The ratio of the air flow from the hot part to the theory

$$\beta_{\text{en}}^* = \alpha_T - \Delta\alpha_T = 1,3 - 0,2 = 1,1 \quad (1)$$

Air intake to the air heater $\Delta\alpha = 0,2$

The temperature of the air at the entrance $t_{pr} = 30$ [°C]

Enthalpy of air at the entrance $I_{pr}^0 = 218$ [kcal/kg]

Enthalpy of gases at the inlet $I^1 = 3315$ [kcal/kg]

The temperature of gases at the inlet is $v^1 = 415$ [°C]

Balance in heat intake.

$$Q_6 = (\beta_{\text{en}}^* + \Delta\alpha/2)(I^0 - I_{np}^0) = (1,1 + 0,2/2)(1300 - 218) = 261,6 \text{ [kcal/kg]} \quad (2)$$

Enthalpy of exit gases

$$I^2 = I^1 - Q_6/\varphi + \Delta\alpha I^0 \quad (3)$$

$$I^2 = 3315/0,996 + 0,2/2 * 1300 = 3052,349 \text{ [kcal/kg]}$$

Outlet gas temperature $\vartheta^2 = 122$ [°C] ($\alpha = 1,35$)

Average gas temperature $\vartheta = 0,5 (\vartheta^1 + \vartheta^2) = 0,5 (340 + 141) = 268,5$ [°C]

Average air temperature $t = 0,5 (t^0 + t_{np}^0) = 0,5 (140 + 30) = 85$ [°C]

Average temperature difference $\Delta t = \vartheta - t = 268,5 - 85 = 183,5$ [°C]

Average wall temperature

$$t_d = (x_1 v + x_2 t)/(x_1 + x_2) \text{ [°C]} \quad (4)$$

$$t_d = (0,542 * 268,5 + 0,375 * 85)/(0,542 + 0,375) = 193,4591 \text{ [°C]}$$

Average speed of gases:

$$\omega_g = (B_p * V_r(\vartheta + 273))/(3600 * 273 F_r) \quad (5)$$

$$\omega_g = (54000 * 0,016 * (268,5 + 273))/(3600 * 273 * 0,0135) = 35,262515 \text{ m/s}$$

Average air speed:

$$\omega_0 = (B_p * V^0(\beta_{\text{en}}^* + \Delta\alpha/2) * (t + 273))/(3600 * 273 * F_g) \text{ [m/s]} \quad (6)$$

$$\omega_0 = (54000 * 0,00263 * 1,2(85 + 273))/(3600 * 273 * 0,0006) = 105,0396 \text{ [m/s]}$$

Heat transfer coefficient from gas to wall

$$\alpha_{gk} = C_H * C_{cp} * C_l * \alpha_H = 1,6 * 1,13 * 1,1 * 76,4 = 30,8 = 30,8 \left[\frac{\text{kcal}}{\text{m}^2} * \text{ch} * ^\circ\text{C} \right] \quad (7)$$

Wall-to-air heat transfer coefficient

$$A_{hk} = C_H * C_{cp} * C_l * \alpha_H = 1,6 * 1,0 * 1,01 * 41,3 = 33,8 = 33,8 \left[\frac{\text{kcal}}{\text{m}^2} * \text{ch} * ^\circ\text{C} \right] \quad (8)$$

Utilization factor $\zeta = 0,85$

Heat transfer coefficient

$$K = \zeta / (1/x_1 \alpha_k^r + 1/x_2 \alpha_k^B) \quad (9)$$

$$K = 0,85 / (1/0,542 * 30,8 + 1/0,375 * 33,8) = 6,123978$$

Heat transfer from a hot heat carrier.

$$Q_m = K * H_r * \Delta t / B_p \text{ [kcal/kg]} \quad (10)$$

$$Q_m = 6,12 * 41233,2 * 183,5 / 54000 = 858,0706 \text{ [kcal/kg]}$$

By increasing the average temperature difference from the determined values, we can see the change in the amount of heat given by the hot heat carrier from the graph below.

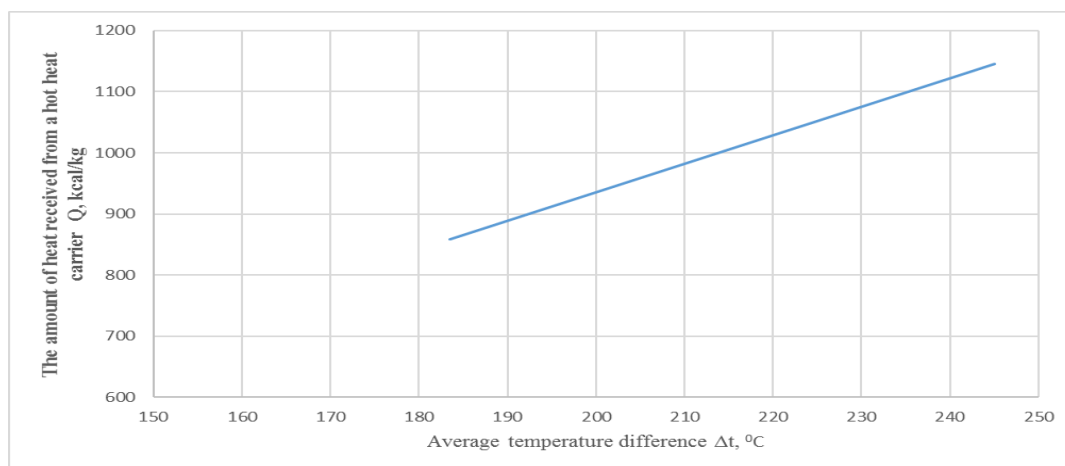


Figure 1. The graph of the relationship between the amount of heat and the average temperature difference.

Conclusion

It can be seen from the graph (Figure 1) that the surface of the heat carrier can receive more heat energy by increasing the average temperature difference, and by increasing the heat transfer coefficient, heat exchange can be accelerated. The efficiency of the station is also determined by the transfer of heat from the hot surface to the cold surface.

In conclusion, it can be said that the lower the heat of the flue gas entering the air heater and the more fully this heat is used, the higher the efficiency is, it is clear in theoretical studies.

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Rezyume: Maqolada Taxiatosh IES (IES) regenerativ havo isitgichining asosiy parametrlari va issiq sirtning issiqlik almashinuvini hisoblash natijalari keltirilgan.

Резюме: В статье представлены основные параметры регенеративного воздухонагревателя Тахиаташской теплоэлектростанции (ТЭС) и результаты расчета теплообмена горячей поверхности.

Kalit so'zlar: regenerativ havo isitgichi, issiq issiqlik tashuvchisi, sovuq issiqlik tashuvchisi, harorat farqi, kirish gazining harorati.

Ключевые слова: регенеративный воздухонагреватель, горячий теплоноситель, холодный теплоноситель, перепад температур, температура газа на входе.

THE RAISE OF ENERGY EFFICIENCY IN RESIDENTIAL BUILDINGS

Aytbaeva A.A.

Karakalpak state University named after Berdakh

Summary: *The new rules connected with the increase of the energy efficiency of residential buildings and the importance of improving energy efficiency by constructing and renovating buildings within the framework of the project are described in the article.*

Key words: *energy, temperature, ventilation, walls, roof, foundations, windows.*

The raise of the energy efficiency of modern residential buildings being built in our country at present is becoming the demand of the period, a need of the hour, because the majority of the existing residential buildings in the Republic of Uzbekistan are houses designed and built on the basis of individual projects.

In building such kind of houses the climate of our country, including Central Asia, is being hot and sharp continental. The temperature in the premises of the building in such climatic conditions is 40-45⁰C in summer and the room temperature goes beyond 45⁰C. This creates an uncomfortable microclimate in the room. It is very important to take into account the dry-hot climate of Uzbekistan in analyzing the residential buildings being built in the climatic conditions of Uzbekistan from the point of view of improving energy efficiency, analysis of energy-efficient shutters, door windows and the location of the residential building in the territory of the modern residential building projects. It is based on the choice of optimal decisions on the energy efficiency and technical decisions on modern residential houses recommended for huge constructions.

Decisive actions have been acquainted by the midst of XX century in decreasing the usage of material and energetic resources, the analysis from the point of economics and state technical policy includes the economic matters of energetic reconstruction of large panel residential houses. Taking into account the increase in number of the population and its income in our independent Uzbekistan, acceleration of the urbanization process and relevant changes in the structure of the consumption, the need in the energy resources in the sphere of the building may increase for 2.5 times (61.2 million toe) by 2030. It is necessary to take complex measures on raising the energy efficiency in this branch on such conditions in order not to let the gap appear between the demand and energy supply, provide smooth energy supply of residential, commercial and administrative buildings and also, the social protection of people's rights.

The reserves of the main sources of energy (oil, gas, coal), in different experts' opinions may be available for most the next hundred years. Almost the half of energy use in developed countries belongs to residential houses. Consequently, on of the main methods of resource economy is the increasing energy efficiency of buildings.

As the studies show, the rate of the heat loss in buildings is 30-35% through ventilation, 10-20% through the roof, 20-40% through windows, 15-25% through walls.

The main principle of the project design of energy sufficient buildings is in supporting inner temperature in optimal state without heating and ventilation due to the maximum hermeticization of the building and the use of alternative energy sources.

The advanced technologies of energy efficiency are made by foreign countries. The first energy effective houses were built in the USA. At present, a number of positive works in the construction of energy efficient buildings are held. By the experience of European countries, it is possible to decrease the loss of energy even in the residents built in the old rules. The buildings in Europe are divided into the next types by their usage:

“Old buildings” (before 1970) spend 300 KBT c/ m^2 .

“New buildings” (from 1970 to 2000) spend more than 150 KBT c/ m^2 .

“Low-energy houses” consume more than 60 KBT c/m^2 .

“Passive houses” spend more than 15 KBT c/m^2 .

“Zero energy houses” consume 0 KBT c/m^2 .

“Plus energy houses” or “active houses” produce more energy than they consume due to the use of renewable energy sources.

Energy effective houses are oriented on the following technologies:

- The decrease of the heat loss;
- Rational use of energy sources;
- The implementation of automatic system of control.

The energy effective houses are of two types:

Energy effective houses are divided into two groups:

Passive houses – the buildings with very low energy use;

Active houses – the buildings that generate the energy themselves with the help of restored sources.

According to the analysis, related consumption of heat energy in passive houses is ten times little than in old buildings. Wherein keeping the heat is provided by the usage of modern energy keeping technologies or high effective heat accumulating materials due to the constructive features of the building.

At present, active buildings are not as popular as passive buildings. The reason is that the construction of such building requires a lot of resources (financial, material, human, etc.) and modern technologies.

Almost half of the total energy consumption in Uzbekistan is accounted for by buildings (24.1 million toes per year). At the same time, the energy consumption of buildings in Uzbekistan is 2-2.5 times higher than in developed countries. In Uzbekistan, average energy consumption during a year is 0.8% of construction, 6.0% of agriculture, 9.0% of transport, 35.0% of energy and industry, and 49.2% belong to population and utility sector. It can be seen that 50% of all energy consumed in Uzbekistan in one year or 24.1 mln. tons of oil equivalent corresponds to the contribution of buildings. The problems about energy saving are neglected in the design and construction of buildings, which leads to excessive energy consumption.

The program of Action Strategy on five priority areas of development of the Republic of Uzbekistan in 2017-2021, approved by the President of the Republic of Uzbekistan Sh.M. Mirziyoev, the Decree of the first president of the Republic of Uzbekistan I. Karimov “On measures to further development of alternative energy sources” approved on March 1, 2013 are the important legal sources in this direction.

The Law of the Republic of Uzbekistan “On the rational use of energy” adopted on April 25, 1997 is an important legal basis for the rational use of natural resources and the improvement of their energy efficiency. Supply of energy efficiency in the construction and reconstruction of residential and administrative buildings, industrial facilities by using modern architectural and construction solutions and new, energy-saving types of building structures, as well as insulating materials.

To rise the energy efficiency of residential houses constructed in the conditions of dry and hot climate of our country taking into account its orientation in the sun, also to improve and develop an optimal model system and to choose additional heat insulating material for the heat insulation of external barrier structures.

In design and building of residential buildings, first of all, it is necessary to pay attention to the indicators of the construction site. Because residential buildings of this type are designed individually, this in turn requires special attention from the designer.

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Rezyume: Maqolada turor-joy binolarining energiya samaradorligini oshirishga yo'naltirilgan yangi normalar hamda loyiha doirasida binolarni yangi qurip va tamirlab energiya samaradorligini oshirish ahamiyoti yoritilgan.

Резюме: В статье описаны новые правила, связанные с повышением энергоэффективности жилых зданий и важность повышения энергоэффективности путем строительства и реконструкции зданий в рамках проекта.

Kalit so'zlar: energiya, xarorat, ventilyatsiya, devorlar, tom, poydevorlar, derazalar

Ключевые слова: энергия, температура, вентиляция, стены, крыша, фундамент, окна.

UDK 372.853

DEVELOPING AN ELECTRON EDUCATIONAL COMPLEX ON PRESENTATIONAL MULTIMEDIA GUIDEBOOK OF EXERCISES ON THE BASIS OF INFORMATION COMMUNICATION TECHNOLOGIES (ICT) INTEGRATION ON PHYSICS-I

Kaypnazarov S. G., Sagidullaeva M.A.

Tashkent university of information technologies named after Mukhammed Al- Khwarizmi

Summary: *There was given information on the process of projecting the electron studying complex, methods of effective using and enhancing a productivity of education quality in higher education institutes.*

Key words: *Advanced education technologies, information communication technologies, simulation environment, new textbooks, online studying resources, multimedias and videolections, the electron studying complex.*

Introduction

Information and communication technology (hereinafter referred to as ICT) is one of the most important and irreplaceable technologies of the twenty-first century. Among others, the rise of new technologies leads to important changes in the field of education. Educational systems in most EU countries [1.163], including Slovenia, face a major problem of how to include the rapidly changing ICT field systematically and on a daily basis into teaching and learning. Consequently, in recent years, many studies of ICT integration [2.24] and its potential in the educational field were published.

ICT in education has a double role. Technology brings new tools that improve the teaching and learning process, but at the same time, ICT is a part of the curriculum with the goal of preparing students for life by providing them with all the necessary skills and knowledge. Note, that by word “student,” we mean everyone who is studying at any educational level. We need to be aware that technology itself cannot be effective every time and does not necessarily improve students’ knowledge.

The main part

Technology is evolving and scholars in the areas of Information Technology (IT) and education technology are continuing to study how multimedia technologies can be harnessed for the enhancement of teaching and learning. A software tool can be used to expand teaching and learning in various fields. It is important to provide students with practical experience in most fields of learning.

The importance of multimedia technologies and applications in education as a teaching or learning tool cannot be over emphasized. This has been confirmed in several studies that have investigated the impact of multimedia technology to the education system [3.13] demonstrated the importance of using multimedia tools in Mathematics classes and found that the multimedia tool greatly enhances students' learning. Several works exist that show that multimedia enhances students' learning [4.75].

Multimedia communication has close similarities to face-to-face communications. It is less restricted than text and ensures better understanding [5.58]. Multimedia technology helps simplify abstract content, allows for differences from individuals and allows for coordination of diverse representation with a different perspective. The use of the computer-based technique as an interface between students and what they are learning with suitable fonts and design can be very valuable.

Certainly, multimedia technology brings about improvement in teaching and learning, however, there are a number of limitations in this technology for educational purposes. Some of

these limitations include unfriendly programming or user interface, limited resources, lack of required knowledge and skill, limited time and high cost of maintenance among others [6.212].

ICT has brought new opportunities for the acquisition and creation of knowledge. It has become a vital element of the modern processes of education. In general, the term e-learning refers to the possibility or the use of ICT in education [7.245].

This research is an e-module development that aims to support students' learning independence. One of the causes of the students' low learning independence is the lack of teaching materials that can support the students' learning independence. The use of teaching materials and monotonous methods make students lazy and bored in learning so that it impacts the independence of learning. Research and development method of plomp models used in this study which consists of a preliminary research stage (Preliminary Research), the design phase or prototype (Development of Prototype phase), and the assessment phase. The research This research was conducted at a high school in the city of Padang class XI IPA. The validity test was given to 2 material expert lecturers, 2 media expert lecturers, and 1 linguist lecturer, and tested by 2 educators and 15 students for practicality, and 20 students for effectiveness. The results of this study are said to be very valid with a value of 90.66, very practical with a value of 94.5, and very effective with a value of 89.2. Based on data acquisition, it appears that the E-Module physics uses "Construct 2" to support the learning independence of students categorized as very valid, very practical, and very effective in learning physics[8.79].

The method of competences level automated management is developed for student's competences formation. An insufficient level of schools graduates in physics is identified as the modern problem of the education. Teacher does not specify which step in a solution a student can not cope with, and the student reiterates his mistake in other tasks solving. It is propose to prepare students to a physics examination by means of tasks solution competences formation. The special software for intellectual support of optimal solution of analytical physical tasks was developed[9.351].

Currently, there are special requirements to the system of higher education, focused not only on imparting knowledge to students, but also on the formation of the continuous need for independent self-education, self-creative approach to getting knowledge throughout their active life. In this regard, the role of students' independent work with its potential to revitalize educational and research activities, to form general and professional competencies, self-education and self-promotion increases significantly. Currently, high-quality educational process is impossible without effective information and communication technologies. Particular importance is attached to the development and use of electronic educational courses which provides that all students of the academic group, without exception, will be involved into the process of learning. However, experience shows that students and teachers are not adequately trained to organize independent work effectively, and there are many issues that need to be addressed. The paper considers the problem of organization of students' independent work in the study of physics through the use of remote modules, and describes the experience of the development and application of electronic learning courses (ELC) for the major sections of physics at the Physics and Mathematics Department in Elabuga Institute of Kazan (Volga region) Federal University. The obtained results prove the importance and effectiveness of the developed electronic educational courses in the study of physics in the context of improving the efficiency of students' independent work when competency approach is used for task bachelors that enhances their competitiveness[10.1743].

This paper explored on readiness and level of acceptance and perceptions towards e-learning among Physics students of Physics with Electronic Programme of University Malaysia Sabah. A constructive approach (i.e., Problem-Based Learning (PBL)) was implemented using an e-learning as its main medium of teaching and learning (T&L). Two (2) physics subjects were

involved (i.e., Thermodynamics Physics and Statistical Physics) which were offered on Semester 1 and Semester 2 respectively which took twenty eight (28) weeks durations. During the class, teaching and learning activities were done via elearning including some of their assessment (i.e., online discussion, forum, uploading and downloading files, etc.). A set of questionnaire was distributed to twenty five (25) second year students before and after e-learning was implemented. Students' response towards e-learning also enclosed in this paper[11.21].

According to the law on March 19, 2021, number №5032 “On regulations of developing scientific investigations and increasing education quality in the field of physics” adopted by the President of the Republic of Uzbekistan, Sh.M.Mirziyoyev, we are intended to create the electron educational complex of the guidebook on presentational multimedia tasks on Physics I, on the resource of ICT-integration in Karakalpak language which includes such kind of tasks as: increasing teaching quality of physics in educational institutes, introducing the newest teaching methods to the education process, selection of motivated students and preparing specialists who are patient for the competition in the labor market

This textbook on “Physics” with the help of using internet technologies has been supported by these sites as: <http://fizika.uz> and <http://estudy.uz>. Students could see their visual experiments through the pedagogic operative supplies and also can observe the animation role-players on themes that were given in the textbooks. The students will be able to control their knowledge that has been mastered by themselves through testing tasks on online regimes as well as through this education management system: <http://fizika.uz>, <http://moodle.fizika.uz> and <http://estudy.uz>.

The course “Physics I” consists of these parts in below: such as mechanics, a molecular physics, thermodynamics and electromagnetism, in its turn, it is sized in 747 MB, in total 15 lection texts, 15 presentations, 15 practical tasks, 15 laboratorial works, 15 independent education tasks, glossary, program of subject, academic working guide-lines, testing questions and evaluation criteria. The students can be able to observe information, that are necessary for them and also be able to load on this link: [https://fizika1eoq-ksg-titunf.vercel.app/\(Figure-3\)](https://fizika1eoq-ksg-titunf.vercel.app/(Figure-3)).



Figure-3.The electron educational complex of the guide-book on presentational multimedia tasks on Physics I.

A table. A system and the main indexes of the electron educational complex of the guide-book on presentational multimedia tasks on Physics I.

Tasks A number of orders.	1) The total size, 2) Number of slides, 3) Formats	1) Animation, 2) Diagrams, 3) Number of figures	Number of PVDP, which is suggested for.
1÷15	1) 98.71 Mb 2) 519 3) html, SCORM 1.2,swf	1) 63 2) 15 3) 91	1) 35

The following computer programs had been used in creating multimedia tasks:

- 1) Microsoft Power Point – in projecting presentation files;
- 2) Microsoft Visio – drafting diagrams;
- 3) iSpringSute 9 pro – for formatizing in SCORM and exe;
- 4) CorelDRAW – projecting physical drafts;
- 5) Macromedia Flash MX – for projecting animation role-plays;
- 6) Html, css, And Design - for projecting UI (visual sides) of the operation;
- 7) JavaScript (ReactJS) - for projecting functional side of the operation;
- 8) The library of React-router-dom – is used for providing transitional passages from one sheet to another;
- 9) The library of React-file-viewer – is used for extracting files into the monitor;
- 10) JavaScript – is a language for projecting the operation on the whole, ReactJS – is a framework(technology).

The following electron education resources had been used for projecting multimedia tasks:

- 1) <http://school-collection.edu.ru> - the base of online electron resources;
- 2) <https://phet.colorado.edu> - is a base for the process of animation role-plays;
- 3) www.design-simulation.com - is an environment of Interactive Physics operation which is situated in the site;
- 4) <http://qrcoder.ru> - is a site for generating QR-codes;
- 5) MOODLE LMS - is used for placing multimedia tasks in electron education environment and using in learning process.

This electron educational complex of the guide-book of tasks which had been designed on the resource of the operation on “Physics I” course content, within the system of credit-module that had been already put into practice at TUIT named after Mukhammed Al-Khwarizmi as well as in its branches.

The license that numbered 237-016 and also a visa for publishing in prints had been given to this electron educational complex on the basis of the resolution that numbered-237, on May 31, 2021 by the cabinet of ministries of High and Secondary specialized education (Figure-4).

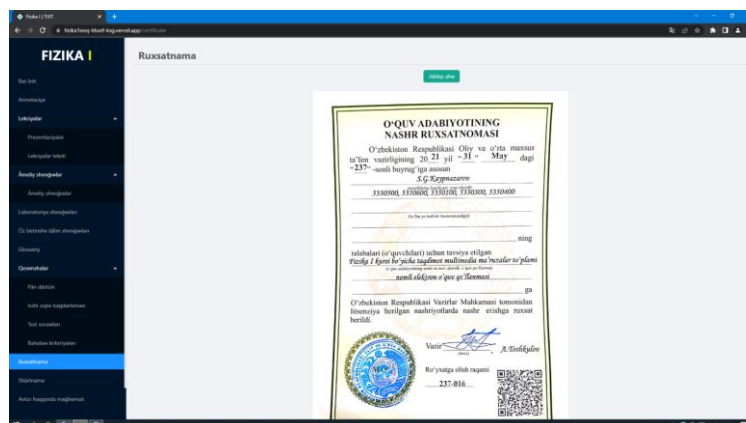


Figure-4. This is a visa of the electron educational complex of the “Guide-book on presentational multimedia tasks on Physics I course”.

As a result, teacher should use this electron educational complex for improving practical skills in studies as well as linking theoretical and practical knowledge in the process of projecting lesson.

Conclusion:

1. This electron educational complex is suitable for the students who study in the field of technics as well as in the direction of working independently.

2. Finally, this electron educational complex has been processed and inserted into the internet networks.

3. <https://fizika1eoq-ksg-titunf.vercel.app/>-students can be aware of the information which are necessary for them and they can also load on this link.

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Rezyume: Bu maqolada oliy o'quv yurtlarida ta'lim sifati va samaradorligini oshirishda zamonaviy ta'lim texnologiyalari va axborot kommunikasion texnologiyalaridan samarador foydalanish usullari hamda elektron o'quv majmua yaratish jarayoni aytilgan.

Резюме: Была дана информация о процессе проектирования электронного учебного комплекса, методах эффективного использования и повышения результативности качества образования в вузах.

Kalit so'zlar: zamonaviy ta'lim texnologiyalari, axborot kommunikasion texnologiyalari, dasturiy ta'minot, simulyasiya muhiti, zamonaviy darsliklar, ochiq o'quv resurslari, multimediali va videolektsiyalar, elektron o'quv majmua.

Ключевые слова: современные образовательные технологии, информационно-коммуникационные технологии, стимулирующая среда, новые учебники, онлайн-ресурсы для обучения, мультимедиа и видеолекции, электронный учебный комплекс.

УДК 621.223

MATHEMATICAL MODEL OF THE USE OF A HYBRID WIND-SOLAR POWER PLANT IN THE FISHING INDUSTRY

Reymov K. M., Uzaqbaev Q. A.
Karakalpak State University named after Berdakh

Summary: *The article analyzes a mathematical model of the types of hybrid wind-solar power plants used in the fish sector of agriculture. The factors hindering the generation of electricity by these stations have also been studied.*

Key words: *Salmon; hybrid wind-solar power plant; Weibull distribution; Betz coefficient.*

Introduction

Researching the effectiveness of hybrid wind-solar power plants in the agricultural and fishing sector is currently considered urgent. The reason is that until now, the disappearance of famous fish species in the field of fishing, and the inclusion of some species in the red book, can be seen as a clear example of this. These fish species include salmon and island moustache. These species are expensive compared to other fish species and are considered to be one of the species with high demand in the market. Global warming, among other environmental problems, has a significant effect on the survival rate of these species in the lakes of our country. For example, for salmon to develop well and gain weight, the water temperature should be between 6 and 18 °C [7]. In our country, very hot summer days lead to the death of these species, and the possibility of saving these species is decreasing. As a solution to this problem, lakes can be eliminated by keeping their temperature moderate through natural artesian waters. In order to eliminate the problem of artesian water release, the use of alternative energy sources is a very alternative solution, taking into account that the lakes are located far from the power supply center. The issues of using hybrid wind-solar power plants for the purpose of extracting artesian waters and the research of their mathematical model are studied in the article.

Problem statement

When researching alternative power plants, it is necessary to take into account various factors affecting its energetic characteristics.

The following factors mainly affect the reduction of electricity production in photovoltaic devices: partial or full shade; orientation; device temperature increase; voltage drop in conductors; pollution of the working surface of the photovoltaic module, bird droppings, snow, dust, industrial pollutants, etc.; causes the deterioration of the properties of photovoltaic devices [2].

Problem solving method

The influence of each of the above-mentioned factors should be taken into account when designing photovoltaic cells. The physical model of photoelectric elements makes it possible to study the main processes in the transformation of solar radiation (insolation) falling on the surface of a photoelectric panel from the sun into electrical energy and other physical properties of photoelectric elements. Such a model is mainly used for in-depth study and analysis of the properties of photoelectric elements.

Experimental determination of the characteristics or studied parameters of a solar photovoltaic device (SPD) in natural conditions requires a number of experiments, which depend on weather conditions, which day of the year and time of day, the availability of the necessary measuring tools and other organizational difficulties. Therefore, compared to the natural experiment, creating a SPD model based on a mathematical model has several advantages.

Analytical models state the state of a complex system in the form of some functional relationships or logical conditions. In the simulation model, the state of complex systems is described in the form of a set of algorithms to implement situations that occur in a real system. The analytical model has several advantages over the simulation model. It provides a complete solution to the problem and provides an in-depth analysis. However, building an analytical model for complex systems is very difficult. Therefore, it needs to be simplified, which can lead to incorrect model performance. In this regard, the simulation model has a number of advantages and is more suitable. Because they can be built on the basis of general assumptions of system tasks. In the analytical model, if it is necessary to change the structural elements of the SPD, it is necessary to completely restructure the model. In the simulation model, it is enough to change only the incoming information [3-4].

The more complex the model, the more likely it is to make mistakes. For successful modeling, it is necessary to separate the main characteristics (factors) from the secondary factors. Ignoring secondary factors allows for a more complete understanding of the main features of the modeled object and the laws of the processes taking place in it.

DigSilent, MatLab (versions after 2008) and a number of similar special programs can be used for SPD modeling. Each program has its advantages and disadvantages in the modeling process. MatLab (Simulink) is a modern program today, which is distinguished from other programs by the abundance of information and ease of use.

Forming the SPD model should mainly be aimed at solving two problems: finding a mathematical description of the situation that occurs during the SPD operation under the influence of internal and external factors, and finding environmental parameters (external factors). Simulation modeling is now gaining more and more advantages in SPD modeling [1].

The power produced by a solar panel (SP) depends on many external factors, mainly the solar radiation coefficient and the temperature on the surface of the panel. The power produced by the solar panel can be determined by the following formula:

$$P_{SP} = \begin{cases} P_{St} \frac{G_{QN}}{G_{St}} (1 + k(T_{SP} - T_{SI})) & \text{if } G_{QN} \geq S \\ 0 & \text{if } G_{QN} < S \end{cases} \quad (1)$$

here P_{SP} – power produced by SP (Vt); P_{St} - nominal power of SP under standard conditions (Standard Test Condition – STC), that is, the power of solar radiation 1000 Vt/m², the temperature of the elements is 25 °C and the solar spectrum is at 45° latitude (V); G_{QN} – coefficient of solar radiation (Vt/m²); G_{St} - coefficient of solar radiation under standard conditions (Vt/m²); k - temperature coefficient (%/°C); T_{SP} – The temperature at the surface of the SP (°C); T_{SI} - 25 °C (temperature under standard conditions); C- energy production coefficient, which depends on the characteristics of the SP (Vt/m²).

Average power produced by SPs in a given period:

$$P_{ava.SP} = E_i \cdot \eta_{SP} \cdot \eta_{inv} \cdot S_{SP} \cdot N_{SP} \cdot \frac{(T_{pd} - T_{pbs})}{T_{pd}}; \quad (\text{Vt}) \quad (2)$$

here: E_i – daily average value of directed surface solar radiation for i -month; N_{SP} - Number of SPs; η_{SP} – efficiency coefficient of SP; η_{inv} - efficiency of the inverter; S_{SP} – The area of the surface of the SP in the unshaded part, (mm²); T_{pd} - number of days for the current month; T_{pbs} - the number of sunless days for the current month.

Annual amount of electricity produced by SPs:

$$W_{SP}^{exp.} = \sum_{i=1}^k E_i \cdot \eta_{SP} \cdot \eta_{inv} \cdot S_{SP} \cdot N_{SP} \cdot (T_{pdi} - T_{pbsi}); \quad (\text{Vt} \cdot \text{hour}) \quad (3)$$

The mathematical model of wind power plants can be described as follows. The power generated by a wind power plant can be determined from the following expression:

$$P_m = 0,5 \rho F v_{ava}^3 = 0,5 \cdot \rho \cdot A \cdot C_p \cdot (\lambda, \beta) \cdot v_{ava}^3 \quad (4)$$

ρ – air density (under normal circumstances $1,226 \text{ kg/m}^3$); F – cross-sectional area of the wind flow, m^2 ; A – cover the rotor surface; v_{mid} – average annual wind speed (m/h); $C_R(\lambda, \beta)$ – power (aerodynamic) coefficient, which is a function of the rotor's λ (relative speed) and β (the angle of rotation of the blades). Theoretically, the maximum value of the power factor is equal to 0.593 [5], which is also commonly called the Betz factor. For small power WPD $C_p \approx 0,35$ ($\eta \approx 0,85$) [6].

$$C_R(\lambda, \beta) = 0,73 \left(\frac{151}{\lambda - 0,02\beta} - \frac{0,453}{\beta^3 + 1} - 0,58\beta - 0,002\beta^{2,14} - 13,2 \right) e^{-\left(\frac{18,4}{\lambda - 0,02\beta} - \frac{0,0552}{\beta^3 + 1} \right)} \quad (5)$$

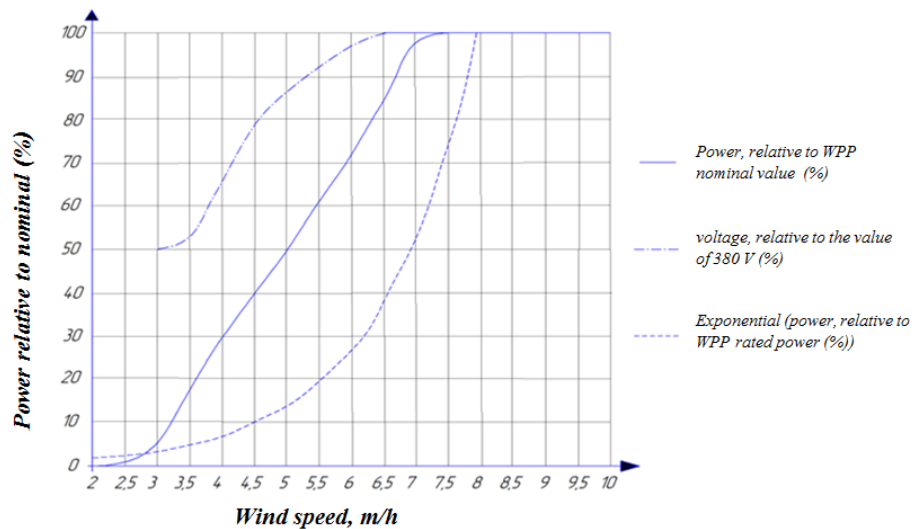
It is defined as the arithmetic average of the instantaneous wind speeds measured at equal times in a certain time interval, i.e:

$$v_{ava} = \frac{1}{n} \sum_{i=1}^n V_i; \quad \left(\frac{\text{m}}{\text{h}} \right) \quad (6)$$

where n is the total number of measured instantaneous speeds; V_i – instantaneous wind speed, m/h.

The power of the wind turbine (PWT) is directly proportional to the wind speed and inversely proportional to the number of blades of the working wheel.

$$N_{PWT} = f\left(\frac{V}{n}\right); \quad (Vt) \quad (7)$$



1- picture. Power factor of the wind generator.

The WPP power description (which relates electrical power to wind speed) is very useful in analyzing the electricity it produces (1-picture).

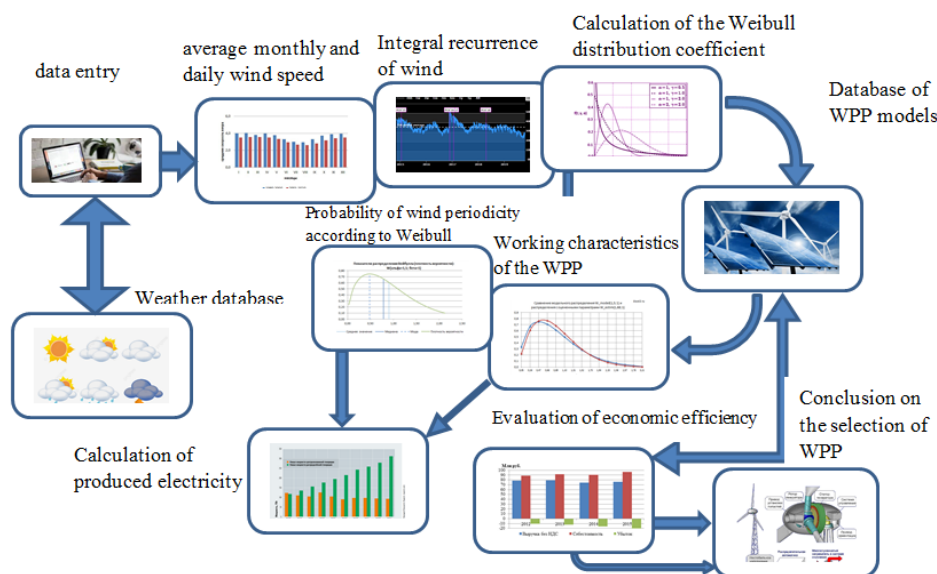
Such a description is often determined by experiment. As can be seen from the figure, if the wind speed decreases from 3 m/h, the amount of electricity produced by WPP also decreases (in this case, the generating capacity of the power plant can be considered zero).

Power output from a wind turbine:

$$N_i(v) = 0,5 \cdot \xi \cdot \rho \cdot \pi \cdot R^2 \cdot v_{or}^3 \cdot \eta_{red} \cdot \eta_{gen} \cdot \eta_{inv}; \quad (Vt) \quad (8)$$

here, ξ – wind utilization factor (reaches its maximum value in nominal mode for a high-speed wind turbine), $\xi = 0,4 \div 0,5$; ρ – air density (under normal conditions $1,226 \text{ kg/m}^3$); R –

wind turbine rotor radius (m); η_{red} - efficiency of the reducer (%); η_{gen} - efficiency of the generator (%); η_{inv} - efficiency of the inverter (%).



2-picture. WPP sampling algorithm.

To increase the reliability of the calculations, it is necessary to use the values obtained as a result of long-term observations of the wind speed in the selected area and the WPP selection algorithm (2-picture).

Using the Weibull distribution function, it is possible to determine the probability of wind recurrence by expressing the velocities in any interval. Then it is possible to determine the average annual (expected) amount of electricity produced by WPP:

$$W_{WPP}^{exp} = T_{WPP} \cdot \sum_{i=1}^m P_i(v) \cdot N_i(v); (Vt \cdot \text{hour}) \quad (9)$$

here, T_{WPP} - hours of use of installed power of WPP during the year; m - number of gradations of wind speed; $P_i(v)$ - repetition of speed in gradations; $N_i(v)$ - The output power for the current wind speed, which defines the WPP performance, (Vt).

Conclusion

Based on the mathematical model considered above, it is possible to design the installation of a hybrid wind-solar power plant in the lake area. Also, based on the design, it makes it possible to determine the probable value of the generating capacity of the station depending on the weather forecast.

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Rezyume: Maqolada gibrid shamol – quyosh elektr stansiyalarini qishloq xo'jaligining baliqchilik sohasida qollanish maqsatida foydalaniluvchi turlarining matematik modeli tahlil qilingan. Shuningdek, bu stansiyalarning elektr energiya ishlab chiqarishiga tosqinlik qiluvchi omillar tatqiq qilingan.

Резюме: В статье проанализирована математическая модель типов гибридных ветро-солнечных электростанций, используемых в рыбный сектор сельского хозяйства. Исследованы также факторы, препятствующие выработке электроэнергии этими станциями.

Kalit so'zlar: Lasos; gibrid shamol – quyosh elektr stansiyasi; Veybull taqsimoti; Betz koeffitsienti.

Ключевые слова: Лосось; гибридная ветро-солнечная электростанция; распределение Вейбулла; Коэффициент Беца.

DETERMINATION OF THE RELIABILITY OF THE WATER NETWORKS OF THE CITY OF NUKUS

Abdiganieva G.¹, Bakhramov U.²

¹Karakalpak state university named after Berdakh, ²Tashkent State Transport Universit.

Summary: *This article is devoted to the development of methods for the functioning of the pipeline water supply networks of the city of Nukus, which occurs in the conditions of failures of various passive and active elements.*

Key words: *water supply, requirements, passive, active elements, engineering networks.*

This work is devoted to the development of methods for the functioning of the pipeline water supply networks of the city of Nukus, which occurs in the conditions of failures of various passive and active elements. In this case, each passive element can only be in two states - operable and inoperative, i.e. the state in which it should be excluded from the design scheme of the water supply network. An assessment of the states of active elements can also be given simply if we are talking about one pump, compressor, throttle, etc. If an active source included in the water supply network scheme actually consists of several parallel operating pumps, the assessment of its states is much more difficult, since the failure of one of the pumps can only slightly change the characteristics of the entire active element as a whole, and the presence of standby pumps can completely compensate for the consequences in a short time. failure that has occurred.

Therefore, the correct determination of the requirements for the hydraulic characteristics of active elements (the magnitude of the flow and pressure in all possible network operating conditions), the determination of a reasonable (minimum necessary) reserve of equipment for pumping and compressor stations is one of the most important tasks in the design of engineering networks.

Despite the fact that the very concept of the reliability of a technical system is defined quite simply - "reliability is the probability that the system will perform its functions in full within a given period of time, under given operating conditions" [1], the definition of specific parameters of reliability of a designed or operated engineering network is today a very complex theoretical and practical problem. For complex energy systems, namely, they include engineering networks of heat, water, gas supply systems used in the urban economy, this problem is associated not only with the difficulties in determining reliability indicators for a series-parallel connection scheme of passive elements, but with the very concept of failure in the water supply network, which ensures the transportation of the target product to many consumers at the nodes of the network diagram.

In this case, even the normal supply of the target product to one of the circuit nodes is disrupted, then, obviously, this state cannot be considered a failure of the engineering network as a whole. This situation leads to the fact that in the analysis of complex systems, in some cases, not reliability indicators are proposed, but performance indicators [2]. However, in this case, too, the difficulties are quite great when the question arises of choosing a certain norm of this efficiency for the operating conditions of a particular scheme in public utilities.

As a result of the research, it was revealed that at present, various recommendations for determining the reliability indicators of water supply networks are quite contradictory, discussions and have not been widely used in practice. In real conditions, design organizations carry out calculations of the steady flow distribution with the exclusion from the design scheme of the engineering network of a small number of passive elements with the highest flow values in the complete scheme and, using these data, refine the characteristics of active elements. At the same time, a significant part of the data on the failure flows of passive elements obtained in a number of studies does not find practical application. In addition, the above calculations are carried out only at the maximum design loads in the network nodes, although, as it was found, these loads have a very

low probability of occurrence and therefore the results obtained do not characterize the behavior of the system throughout the considered time interval.

One of the possible methods that have already found application in the practice of designing electric power systems for determining reliability indicators and assessing the consequences of failures of system elements is statistical modeling (Monte Carlo method). In this method, the natural course of the random process of occurrence of failures (and recovery) is simulated and, with a sufficient duration of simulation, estimates of reliability indicators can be obtained on this basis [1]. In the Monte Carlo method, modeling consists in determining the moments of occurrence of failures, depending on the given distributions of the probability of failure-free operation for all elements of the system.

In principle, if we combine the simulation of a random flow of failures with the simulation of random processes of water consumption in the nodes of the design scheme of the water supply network, then we can find estimates of the consequences of failures of passive elements for given characteristics of active power sources or, conversely, determine the requirements for these characteristics based on the need to maintain pressures in all nodes of the network.

At the same time, it will be very difficult to simulate random processes of water consumption over such long intervals. Thus, the use of the Monte Carlo method to study the reliability of designed engineering networks does not lead to a great effect due to the above provisions.

The main purpose of this work is to propose such a model of an engineering network that will provide the construction of probability distribution functions for the required pressures of power sources that take into account the reliability of the network. To achieve the goal, it seems more appropriate not to simulate by the Monte Carlo method, but to combine network methods for studying reliability and the state space method [2].

The first step of network methods is to build a logical or structural diagram of a complex network system in which water sources and consumers are connected by a pipeline engineering network. There are significant differences between the design scheme of a network built depending on its physical scheme and the logical scheme, which lies in the fact that the latter is built so that on its basis it is possible to determine combinations of element failures that lead to the failure of the system as a whole.

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Rezyume: *Ushbu maqola turli passiv va faol elementlarning ishdan chiqishi sharoitida yuzaga keladigan Nukus shahrining quvurli suv ta'minoti tarmoqlarining ishlash usullarini ishlab chiqishga bag'ishlangan.*

Резюме: *Данная статья посвящена разработке методов эксплуатации водопроводных сетей города Нукуса в условиях выхода из строя различных пассивных и активных элементов.*

Kalit soʻzlar: *suv ta'minoti, talablar, passiv, faol elementlar, muhandislik tarmoqlari.*

Ключевые слова: *водоснабжение, требования, пассивные, активные элементы, инженерные сети.*

STUDY OF THE INFLUENCE OF BIOSTIMULATORS ON THE NUTRITIONAL QUALITY OF CEREAL CROPS IN THE REPUBLIC OF KARAKALPAKISTAN

Kurbanbaeva G.S.

Karakalpak state University named after Berdakh.

Summary: *Cereal crops are an integral part of agriculture, because almost 90% of agricultural land is covered with cereal crops. Therefore, it is important to protect grain crops from various pests and supply them as ready-made food to the people. Therefore, in agriculture, biostimulants are widely used to increase the yield of grain crops and fight pests.*

The use of biostimulants is one of the ways to increase the productivity and stability of agricultural plants. Therefore, the main task of this article is to use biostimulants in the agriculture of the Republic of Karakalpakstan to grow high-yielding grain crops and determine the effect of biostimulants on the nutritional quality of grain crops.

According to the results of the research, an effective result was achieved by applying biostimulants to grain crops in the Republic of Karakalpakstan, and there was no adverse effect of biostimulants on the nutritional quality of grain crops.

Key words: *biostimulants, grain crops, Republic of Karakalpakstan, methods, indicators, species.*

One of the main factors of increasing the productivity of agricultural grain crops is the effective protection of plants from diseases, weeds, and pests. The chemical method plays an important role in the fight against crop loss [9.133-134].

In order to increase and stabilize the productivity of agricultural plants, technologies compatible with natural conditions are required. An important element of such technologies is the use of growth regulators. It has long been known to encourage pre-sowing treatment of seeds [10].

The use of standard equipment for feeding seeds in production conditions, in contrast to stimulatory effects, significantly facilitates the treatment of stimulatory preparations before planting. The positive effect observed in some cases of seed stimulation is not always repeated, because the influence of weather conditions, quality of seed material, soil and other factors is important [7.1121-1131]. According to the researches of many scientists and practitioners [8,11], high productivity of plants can be achieved by timely adaptation of growth and development rates, increasing the ability of plants to adapt to growth regulators. [6.135-142].

To date, plant growth regulators have found practical application in the following main areas:

- restoration of weakened plants and rejuvenation of old plants;
- due to shoot formation and stimulation of the root system;
- recovery of damaged plants after stress (planting, transplanting, storage, long-term transportation, suboptimal lighting and temperature, pesticide treatment, soil salinity, etc.);
- due to the increased synthesis of chlorophyll and other pigments, prompting early and abundant flowering, intensive coloring of leaves and watery coloring of flowers;
- evidence of increased resistance to phytopathogens (especially root rot), pests, unfavorable growing conditions;
- call for active growth of vegetative mass;
- activation of the plant's enzymatic and hormonal system, etc.

Modern varieties of agricultural plants have reached the limits of natural genetic variability in a number of key parameters, and it is very difficult to significantly increase their productivity and stress resistance using traditional approaches. The use of biostimulants of various nature is

considered as a perspective of sustainable development and allows to increase productivity without harmful effects on the environment [1-5].

To date, there is no generally accepted definition of a biostimulant. Not only substances or mixtures of substances, but also microorganisms are used as biostimulants of natural origin. So, for example, according to one of the classifications, biostimulants are divided into the following main categories:

- 1) chemical and fulvic acids;
- 2) protein hydrolysates;
- 3) extracts from algae and plants;
- 4) hit ozan and other polysaccharides;
- 5) inorganic compounds;
- 6) symbiotic and beneficial fungi and bacteria [6].

Plants contain various biologically active substances (BAS) such as vitamins, alkaloids, glycosides, saponins, tannins, polysaccharides (gums, mucus, pectins, inulin, fiber, starch), flavonoids, resins, essential oils, and oils. organic acids, phytoncides, pigments, etc. [11.76-86]. Biologically active substances obtained from plants are used to treat humans and farm animals, protect plants, stimulate growth and increase productivity, and regulate insect populations. The extraction of various biologically active substances from conifers is economically promising, because conifers are very common and actively processed. Therefore, biostimulants obtained from conifers are widely used in agriculture.

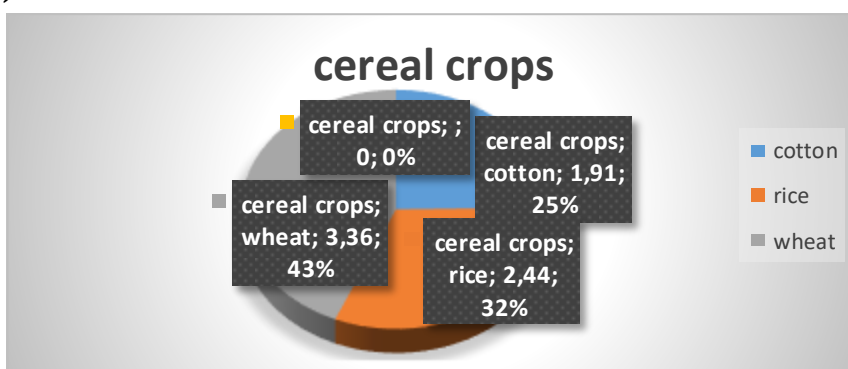
Information on the cultivation of various grain crops in the regions of the Republic of Karakalpakstan is presented in the following table (Table 1). [12].

Table 1

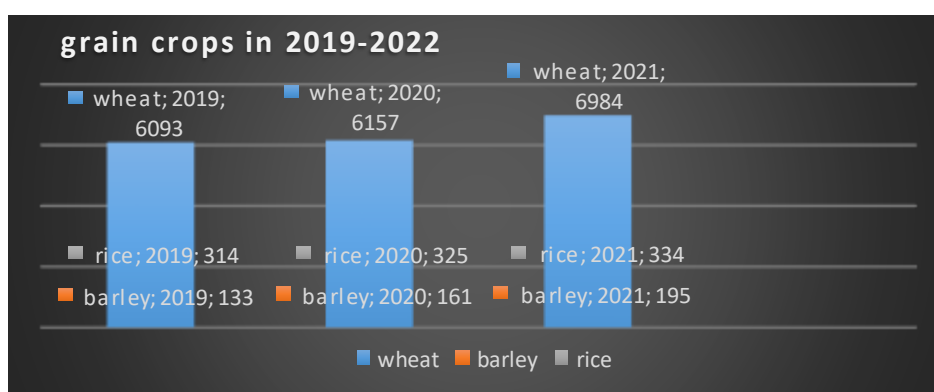
Areas	Character
Qongiro	Most of the cultivated area is occupied by wheat and other grain crops, including rice, followed by cotton.
Moynaq	The indicator of cultivated area in irrigated lands is very low
Shumanay	This area has the highest share of cotton in cultivated areas. The share of wheat is second
Qanlikol	wheat and other cereal crops, including rice, account for most of the cultivated area, followed by cotton.
Chimboy	The highest share of cotton in the cultivated area is in this region. The share of wheat is next
Kegeyli	The highest share of cotton in the cultivated area is in this area. The share of wheat is second
Xodjeyli	The highest share of cotton in the cultivated area is in this region. However, the share of wheat in planting is lower compared to the whole of Karakalpakstan.
Nukus	The share of cotton in cultivated areas is very low. However, different types of crops are produced, compared to other sectors such as wheat, rice, vegetables and fruits.
Karauzak	wheat and other cereal crops, including rice, account for most of the cultivated area, followed by cotton.
Taxtakopir	wheat and other grain crops, including rice, make up the majority of cultivated areas. and the share of cotton follows them.
Beruniy	This area has the highest share of cotton in cultivated areas. However, the share of wheat in planting is lower compared to the whole of Karakalpakstan.

As can be seen from the information in the table, the planting of grain crops in the regions of the Republic of Karakalpakstan differs from one another in the regions. Kanlikol, Takhtakopir, Karauzak, Nukus and Chimboy districts are leading in the cultivation of grain crops, including rice and wheat. (Chart 1)

(Chart 1)



It is in these districts that the cultivation of grain crops using biostimulants was carried out as a test in 2020 and 2021, and we can see the result in the diagram below. (Chart 2)



As can be seen in the diagram, an effective result was achieved by applying biostimulants to grain crops. Let us show the effective result of the cultivation of grain crops, especially wheat, rice and barley, in the period of 2019-2021.

Basically, biostimulants helped to increase productivity, in particular, they accelerated the transition of growth and development stages, reduced the incidence of rhizomatosis and cercosporosis of crops, accelerated seed germination and ripening, and made a great contribution to protecting crops from cold and other adverse conditions. Thus, growth regulators activated plant growth, increased biomass accumulation due to more active leaf growth, enhanced crop growth, and restored nutrient functions.

Conclusion. Based on the information presented above, it can be concluded that the use of biostimulants in agriculture is effective because biostimulants protect cereal crops from diseases and negative effects, weather conditions and the consumption of pesticides and fertilizers. helps in reducing and increasing productivity and most importantly in maintaining the nutritional quality of cereal crops.

In the Republic of Karakalpakstan, the use of biostimulants has gained importance in increasing the productivity of cereal crops and maintaining their nutritional quality. Because of this, it is useful to use biostimulants in agriculture.

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Rezyume: *Donli ekinlar qishloq xo'jaligining ajiralmas qismidir chunki qishloq xo'jaligi yerlaridan qariyb 90 %ini donli ekinlar tashkil qiladi. Shu bois, donli ekinlarni turli xil zararkunandalardan himoya qilish va xalqqa tayyor ozuqa tariqasida yetkazib berish muhim masaladir. Shu sababli, qishloq xo'jaligida donli ekinlarning hosildorligini oshirish va zararkunandalarga qarshi kurashish uchun biostimulyatorlardan keng foydalaniladi. Biostimulyatorlardan foydalanish qishloq xo'jaligi o'simliklarining hosildorligi va barqarorligini oshirish usullaridan biridir. Shu bois ushbu maqolaning asosiy vazifasi – Qoraqalpog'iston respublikasining qishloq xo'jaligida biostimulyatorlardan foydalanib, yuqori hosildorli donli ekinlar yetishtirish va biostimulyatorlarning donli ekinlarning ozuqaviy sifatiga ta'sirini aniqlashdan iboratdir. Tadqiqot natijasiga ko'ra, Qoraqalpog'iston respublikasida biostimulyatorlarni donli ekinlarga qo'llash orqali samarali natijaga erishildi va biostimulyatorlarning donli ekinlarning ozuqaviy sifatiga nojuya ta'siri sezilmadi.*

Резюме: *Зерновые культуры являются неотъемлемой частью сельского хозяйства, так как почти 90% сельскохозяйственных угодий занимают зерновые культуры. Поэтому важным вопросом является защита зерновых культур от различных вредителей и доставка их людям в готовом виде. Поэтому биостимуляторы широко используются в сельском хозяйстве для повышения урожайности зерновых культур и борьбы с вредителями. Использование биостимуляторов является одним из способов повышения продуктивности и устойчивости сельскохозяйственных растений. Поэтому основной задачей данной статьи является использование биостимуляторов в сельском хозяйстве Республики Каракалпакстан для выращивания высокоурожайных зерновых культур и определение влияния биостимуляторов на питательные качества зерновых культур. По результатам исследований достигнут эффективный результат при применении биостимуляторов под зерновые культуры в Республике Каракалпакстан, при этом не отмечено отрицательного влияния биостимуляторов на питательные качества зерновых культур.*

Kalit so'zlar: *biostimulyatorlar, donli ekinlar, Qoraqalpog'iston Respublikasi, usullar, ko'rsatkichlar, turlar.*

Ключевые слова: *биостимуляторы, зерновые культуры, Республика Каракалпакстан, методы, показатели, виды.*

SYNTHESIS OF FE-INTERCALATED MONTMORILLONITES AND INVESTIGATION OF THEIR ADSORPTION CHARACTERISTICS

Qalibaeva U.T.¹, Nurjanova G.I.¹, Sharipova A.I.¹, Abdikamalova A.B.², Seytnazarova O.M.¹, Allamuratova A.S.¹

¹Karakalpak state University named after Berdakh

²Institute of General and Inorganic Chemistry of AS RUz

Summary: The montmorillonite-containing clays of the Krantau and Beshtyuben deposits and the processes of their intercalation with Fe^{3+} polyoxocations have been studied. The XPA results showed that the value of d_{001} , which determines the size of slit-like micropores, depends on the method of clay intercalation. The interplanar distance d_{001} for samples synthesized by the first method is 15.1 and 15.7 Å, respectively, for samples of Krantau and Navbakhor bentonite, while for samples based on the second method they are 13.7 and 14.3 Å. It has been established that intercalated bentonites show increased adsorption activity with respect to water vapor and somewhat underestimated activity with respect to hydrophobic benzene, which indicates an increase in hydrophilic surface groups as a result of intercalation.

Key words: intercalation, polyoxocations, adsorption, desorption, isotherm, bentonite, montmorillonite, X-ray phase analysis.

INTRODUCTION

All over the world, there is a rapid development of the field of science of directed synthesis of new highly efficient highly porous materials for various purposes: for use as adsorbents and catalysts, carriers of dosage forms, fillers of polymeric materials, composites, etc. These processes cannot be carried out without substances with a developed nanoporous structure. Aluminosilicates, both in their natural form and their modified forms, are widely used industrially and are scientifically interesting, due to the possession of a controlled porous structure and composition in the process of purposeful modification.

Industrial practice at the moment in sorption and catalytic processes use materials based on natural and synthetic resources. The main requirements for these materials are a developed specific surface, thermal and chemical stability. Aluminosilicates are characterized by a high absorbing capacity, resistance to high temperatures, and other factors, and as a result, they can serve as substrates for fixing various compounds on their surface, which opens up broad prospects for the transformation of their characteristics and composition [1, 2].

Numerous methods for modifying clay minerals are currently known. Acid treatment [3-6], acid and alkaline activation followed by cation substitution [7] have become the most widely used. Sulfuric acid solutions are used as modifiers in the first case [8], and in the second case Na^+ , K^+ , NH_4^+ , Mg^{2+} , Ca^{2+} , Ba^{2+} ions, etc.

The presence of exchange cations, hydroxyl groups, and adsorbed water molecules makes it possible to significantly expand the practical application of layered aluminosilicates by modifying their surface to impart certain catalytic and sorption characteristics. It is known that the specific surface area of the material increases after modification [9, 10].

Another promising method for modifying the surface of clay particles is chemical treatment with organic molecules [11, 12]. This process makes it possible to purposefully fix hydrophobic organic molecules on the pores of sorbents due to chemical modification; in contrast to sorption modification methods, particles fixed in pores have significant thermal and mechanochemical stability. There are scientific works that show that organophilic bentonites are effective adsorbents for wastewater treatment from active dyes [13, 14], heavy metal ions [15], and microorganisms [16].

The process of introducing groups of atoms between layers of layered materials is called intercalation [17, 18]. Aluminosilicate layers are capable of incorporating (intercalating) inorganic (pillaring), organic molecules with macrosizes, as well as oligomeric compounds [19, 20]. The existing data show that it is possible to intercalate phosphates and diethyl phosphates into bentonite clays, which leads to the production of an effective sorbent for the extraction of strontium ions from aqueous media [21].

Of particular interest are studies aimed at introducing active nanocomponents into the structure of layered aluminosilicates, leading to the creation of supported heterogeneous catalysts. The intercalation of polyvalent metal ions and their mixtures capable of undergoing reversible redox transformations opens up great potential for the use of pillar clays as oxidation catalysts, in particular, for the oxidative degradation of organic matter impurities in industrial effluents [22–24].

The aim of the investigation was to study the processes of intercalation of bentonite clays of the Krantau and Navbakhor deposits.

EXPERIMENTAL PART

The objects of pillaring were natural layered aluminosilicates - bentonites rich in minerals of the misctite group of the Krantau (KR) and Navbakhor (NAB) deposits.

To study the structural features of the materials under study, an X-ray diffractometer (XRD Empyrean PANalytical), an Avatar 360 FT-IR Nicolet iS50 Thermo Fisher Scientific spectrometer with a Fourier transform in the frequency range of 400–4000 cm^{-1} , and an EVO MA10 SEM scanning electron microscope were used.

The textural characteristics of aluminosilicates were determined by the amount of adsorption of water vapor and benzene on a Mac-Ben vacuum adsorption unit. Adsorption was measured by gravimetric and isosteric methods [25]. Before measuring adsorption, clay samples were evacuated at 200 and 500°C (up to a residual pressure in the system of 10–3 mm Hg). The pumping continued for 8 hours. The specific surface area S_{sp} of the samples was calculated based on the Langmuir equation and the BET theory, the volume of micropores V_{μ} was calculated using the t-method. The total sorption volume of meso- and micropores V_0 was determined from the adsorption isotherm of benzene and water at P/P_0 values of 0.995.

Fe^{3+} was chosen as the base metal for intercalation into the interlayer space of aluminosilicates. The processes of intercalation of Fe^{3+} cations into the interlayer space of enriched forms of KR and NAB were carried out in the following sequence (optimal developed methods are given):

1)1) Dry method: calculated amounts of $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ salt (from 1 to 10 mmol Fe^{3+} per 1 g of clay) were added to a suspension of aluminosilicate, where the mass content of solid and liquid phases was 1:15, with constant stirring at room temperature. A 1 M NaOH solution was added dropwise to the resulting suspension at $\text{OH}/\text{Fe}^{3+} = 2$ ratios; after thorough mixing, the suspension was allowed to stand at rest at room temperature for 24 hours or more if necessary;

2) Ash method: solutions containing intercalating agents were prepared by dissolving 67.625 g of the $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ salt in distilled water and bringing the volume of the solution to 500 ml. A 1 M NaOH solution was added dropwise to the resulting solution with constant stirring at a temperature of 50°C until the molar ratios $\text{OH}/\text{Fe}^{3+}=2$ were reached, then the solution was kept at rest at room temperature for 24 hours. A suspension of bentonite was prepared by dispersion using ultrasound with a wave frequency of 50 kHz for 5 min at a mass ratio of the solid and liquid phases of 1:10. Certain amounts of the intercalating solution (from 1 to 10 mmol Fe^{3+} per 1 g of clay) were added dropwise to this suspension with constant stirring. The resulting suspension was left alone for 24 hours. Then the solid phase of the suspension was separated from the liquid by centrifugation, washed until the complete removal of Cl^- ions and dried at a temperature of $100 \pm 1^\circ\text{C}$.

The sieved intercalated materials were calcined at temperatures from 200 to 500°C for 2 hours at a heating rate of 5°C/min.

RESULTS AND DISCUSSION

The XPA results showed that the value of d_{001} , which determines the size of slit-like micropores, depends on the method of clay intercalation. The interplanar distance d_{001} for the samples synthesized by the first method is 15.1 and 15.7 Å, respectively, for the KR and NAB samples, while for the samples based on the second method they are 13.7 and 14.3 Å.

The study of the effect of heat treatment on the thermal stability of samples showed that the thermal behavior of materials is also determined by the nature of the intercalating cation. For samples of 10 mmol Fe per g KR (10-Fe-KR-1) and NAB (10-Fe-NAB-1) obtained by the first method, the value of d_{001} decreases only to 13.4 and 13.6 when heated to 500°C Å, and the intensity of the first basal reflection d_{001} drops to 83 and 79%, respectively, which indicates the preservation of the microporous structure. The thermal stability of these intercalated systems is due to the fixation of nanosized particles of Fe (III) oxides, formed during the dehydration of iron polycations, in the interlayer space of montmorillonite. On X-ray patterns of dried (not calcined) samples of 10-Fe-KR-1; 5-Fe-KR-1; 2-Fe-KR-1; 10-Fe-NAB-1; 5-Fe-NAB-1 and 2-Fe-NAB-1 there are lines characteristic of oligomeric akaganeite (7.4; 3.31 Å). The XPA results showed that the oligomer structure was retained to a large extent during heat treatment up to 300°C. With a further increase in the treatment temperature (more than 300°C), the intensity of the lines characteristic of iron hydroxides (goethite-4.14; 2.7 Å and akaganeite-3.31; 2.54 Å) decreases and additional lines characteristic of iron oxides are found (hematite 2.696, 2.518 Å).

In the case of the second method, at such ratios of complex cations and clay, samples of 10-Fe-KR-2 and 10-Fe-NAB-2 are less stable and, when heated at temperatures of 200-500°C and d_{001} drops to 13.8-10, 9 Å, and the intensity of the first basal reflection decreases to 23-40%. Only in the case of materials obtained by intercalation of iron ions at ratios of less than 5 mmol/g of clay, the d_{001} value drops to 9.6, and the intensity to 4-11%, which indicates the destruction of the original structure during the heat treatment of clays. The intensity of the lines characteristic of the compounds of the groups of iron oxides and hydroxides is very low, which indicates the low content of these nanoparticles in the interlayer space of heat-treated clays.

Similar results were also obtained for bentonite clays of the Navbakhor deposit, which proves the similarity of intercalation processes for the same type of layered aluminosilicates.

Spectrophotometric studies (Fig. 2) were carried out in order to reveal the structural features of Fe^{3+} nanoparticles in the montmorillonite matrix, which cannot be refined by XRD. However, the existing difficulty in studying these nanoparticles by IR spectroscopy is associated with insignificant differences in the vibrational frequencies of Si-O and Fe-O. At the same time, the frequencies can vary depending on the amount of water and hydroxyl groups, which depend on the conditions of the intercalation process.

The interpretation of the spectrum of the enriched Raman sample shows that the main bands manifested on them belong to the valence bonds of silicon and hydrogen with oxygen atoms. A well-defined broad band at 1040 cm^{-1} corresponds to stretching vibrations of the Si-O-Si tetrahedra of the silicon-oxygen framework, and the bands at 467 and 524 cm^{-1} correspond to bending vibrations of the Me-O bonds. The band in the range of 797 cm^{-1} corresponds to Si-O-Si vibrations of rings of SiO_4 tetrahedra. High-intensity bands in the range of $3100\text{-}3500$ and 1638 cm^{-1} refer to OH-stretching and bending vibrations of free and bound water. In the region of $860\text{-}798\text{ cm}^{-1}$, Al-O stretching vibrations of condensed AlO_4 tetrahedra appear [26].

These spectra showed a significant difference in the intensity of the absorption bands depending on the intercalation conditions. The spectra of intercalated clays show the appearance of new chemical bonds. So, after the intercalation of iron polycations into the interlayer space of KR and NAB, the absorption bands at 2823, 3001 and 3093 cm^{-1} are explained by the stretching of hydroxyl groups, and the band at 1467 cm^{-1} is associated with bending vibrations of the Al-O- or Si-O- groups. and their hydrogen bonds with hydroxyl groups. The detection of a peak at 3322 cm^{-1}

can be associated with the presence in the structure of Fe^{3+} cations associated with OH groups. In all samples dried only at 100°C in the range of wave numbers $1610\text{--}1600\text{ cm}^{-1}$, a polymeric form of water was found, which mixes into the region of 1590 cm^{-1} when heated to 200°C , and in samples heated at higher temperatures ($>400^\circ\text{C}$) data peaks are not observed, which indicates the disappearance of elements in the composition of the samples that contribute to their manifestation. At the same time, in the region of $1060\text{--}920\text{ cm}^{-1}$ (1020 cm^{-1}) there is a peak corresponding to the bending vibration of the hydroxyl groups associated with the aluminum atom (Al-OH). The peak at 3620 cm^{-1} corresponds to in-phase stretching vibrations of internal OH-groups or 2Al-OH-bonds of MM.

The presence of interaction between the intercalated component and montmorillonite is reflected in the change in the characteristics of the vibrational frequencies of silicon-oxygen bonds. In samples with a higher content of Fe^{3+} (10-Fe-KR-1; 10-Fe-NAB-1; 10-Fe-KR-2 and 10-Fe-NAB-2), an absorption band at 605 cm^{-1} is observed, which is not observed in the spectra of other samples of intercalated clays. Ignition leads to enhancement and shift of this band to the region of 612 cm^{-1} . Probably, this absorption band is due to the vibration of the Fe-O bond in the structure of the formed Fe_2O_3 crystal structure. Apparently, in other samples with lower Fe^{3+} content in the interplanar space, the bands of Fe-O stretching vibrations are not detected against the background of intense absorption bands characteristic of Si-O bonds.

The results of studying the textural characteristics of intercalated montmorillonites are presented below. The study of the adsorption of water vapor and benzene on intercalated clays showed the distinctive nature of the adsorption isotherm (Fig. 3. and 4). Water vapor adsorption isotherms on the initial and initial calcined samples (500°C) are type II according to the IUPAC systematics.

Clay intercalation promotes an increase in water vapor adsorption at low values of relative pressure, which indicates the formation of new micropores. The water vapor adsorption isotherm on the 10-Fe-KR-1 sample (100°C) has the form of a hysteresis, which indicates the occurrence of irreversible capillary condensation. The maximum amount of adsorbed water for 10-Fe-KR-1 and 10-Fe-NAB-1 is 7.35 and 7.65 mol/kg. Based on the isotherms of water vapor adsorption on the 5-Fe-KR-1 and 2-Fe-KR-1 samples, it can be concluded from the loop hysteresis that irreversible polymolecular adsorption occurs on the inhomogeneous adsorbent surface. The hysteresis loop on the desorption isotherm for the 10-Fe-KR-2 sample closes at a relative pressure of 0.19, which indicates the presence of micropores. The maximum amount of adsorbate on the surface of adsorbents 10-Fe-KR-2; 5-Fe-KR-2 and 2-Fe-KR-2 is: 7.35; 4.218 and 3.42 mol/kg, which is less than the values of the samples synthesized by the first method. High amounts of adsorption of water vapor on intercalated systems are associated with the presence of a strong intermolecular effect between the adsorbate and adsorbate molecules. The calcination led to a decrease in the active centers with respect to water molecules due to the dehydroxylation of the formed interlayer columns. As it turned out, the final dehydroxylation at temperatures above 500°C , in addition to reducing the active hydrophilic sites, leads to a noticeable decrease in the size of available pores.

Unconditionally, in terms of the amount of adsorption of hydrophobic benzene, all the studied objects have relatively low values. However, it can be seen that the adsorption isotherm of benzene vapors on intercalated samples in the region of lower relative pressures has a relatively convex structure and is higher than the adsorption isotherm of the initial KR sample, which proves the increase in micropores as a result of the introduction of Fe^{3+} polycations. The amount of adsorption of benzene on the initial clays KR and NAB, as well as their calcined forms (500°C) is 0.638; 0.742; 0.746 and 0.802 mol/kg, respectively. As it turned out, the pillaring of the samples, on the contrary, contributes to an increase in the adsorption activity with respect to the hydrophobic agent. Thus, for samples of 10-Fe-KP-1 and 10-Fe-KR-2, these indicators have the highest values and amount to 1.205 and 1.123 mol/kg, and for their forms calcined at 200°C , the amount of

adsorption increased by 16.8 and 12.1%, respectively. A further increase in the processing temperature contributes to an increase in the values of these indicators by another 2-3%. With an increase in the relative pressure P/P_s from 0 to 0.2, a phenomenon was observed when adsorption in adsorbents approaches the saturation state of micropores. It was determined that these adsorption isotherms belong to the type I classification proposed by BDDT.

Probably, the improvement in the adsorption characteristics of calcined intercalated clays is associated with a decrease in hydroxyl groups, which prevent the physical adsorption of benzene molecules in pores accessible in size, as well as the formation of complexes with iron atoms in the oxide pillars. At the same time, the 5-Fe-KR-1 and 2-Fe-KR-1 samples calcined at 500°C are characterized by increases in adsorption amounts by 13.1 and 4.5%, respectively. However, the calcined adsorbents obtained by the second method with similar ratios of starting materials do not show noticeable improvements in adsorption performance. On the contrary, for the 2-Fe-KR-2 sample, a decrease in benzene adsorption is observed with an increase in the calcination temperature above 300°C, which indicates the absence of pores with the corresponding characteristics and the necessary iron atom for the formation of compounds in pillar clays.

As the water vapor adsorption data show, the intercalation method has little effect on the values of the average mesopore volume (V_b) of the 5-Fe-KR-1 and 5-Fe-KR-2 samples, which is 0.03. However, the calcination of the 5-Fe-KR-2 sample leads to a decrease in the values of this indicator to 0.0197 or less, while for the first sample, calcination does not cause noticeable changes.

The results of the experiments showed that by intercalating Fe^{3+} ions into the interlayer space of montmorillonite clay KR and NAB, it is possible to obtain samples with the largest volume of micropores. As a result, the development of sorption characteristics with respect to hydrophilic and hydrophobic adsorbates is due to the formation of both micropores and mesopores between disordered fragments of clay layers. New layers can be formed due to the destruction of lamellar particles during ion exchange and heat treatment [12].

Microphotographs of intercalated clay samples show agglomerate particles no larger than 30–40 μm , while for the original sample, the sizes of these particles exceed 50 μm .

CONCLUSION

Thus, an experimental study of the structural characteristics of the Fe-pillar montmorillonites showed that a purposeful change in these characteristics is possible by controlling the intercalation process. Obtaining pillar clays by the first method promotes the formation of more stable pillars with large micro and mesopore volumes, regardless of the nature of the initial bentonite. Heat treatment of these samples does not lead to a noticeable change in the interplanar distance of intercalated montmorillonites, due to the formation of a more complex structure than the classical periodically columnar structure.

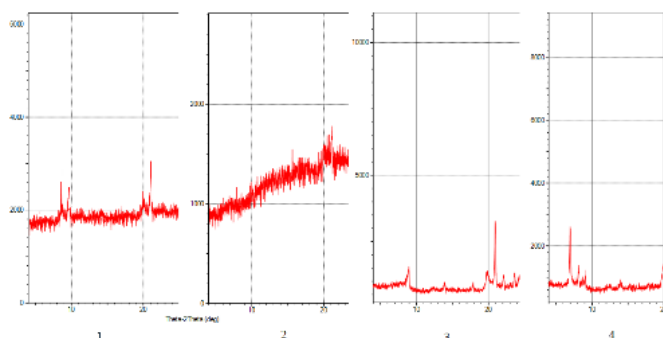


Fig. 1. Diffractograms of the samples: 1) natural KR; 2) calcined at 500°C KR; 3) 5-Fe-KR-1; 4) 10-Fe-KR-1.

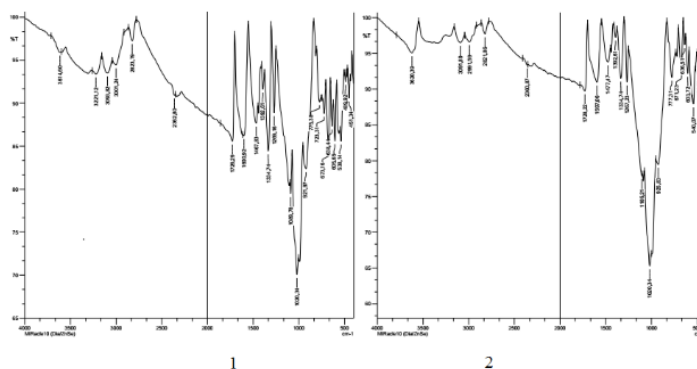


Fig. 2. IR spectra of 5-Fe-KR-1 samples heat-treated at temperatures, °C: 1) 100; 2) 300.

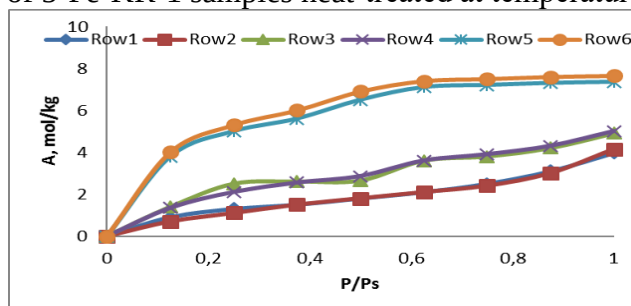
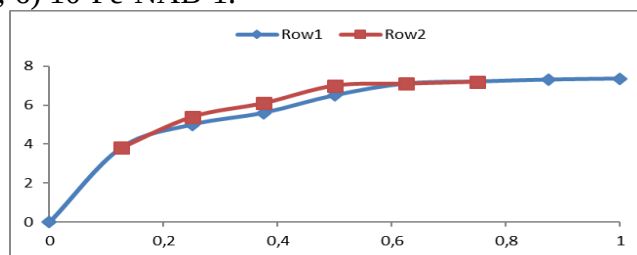
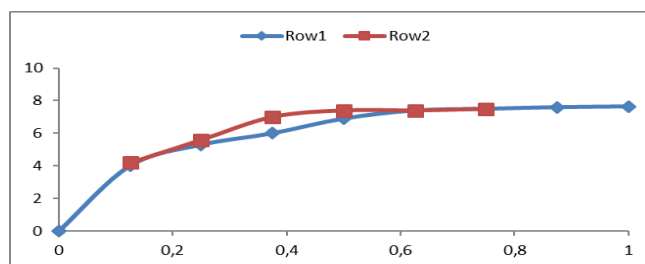


Fig. 3. Adsorption isotherms of benzene vapors on: 1) KR; 2) NAB; 3) 5-Fe-KP-1; 4) 5-Fe-NAB-1; 5) 10-Fe-KR-1; 6) 10-Fe-NAB-1.



A)



B)

Fig. 4. Isotherms of adsorption and desorption of water vapor on A) 10-Fe-KR-1; B) 10-Fe-NSCHB-1.

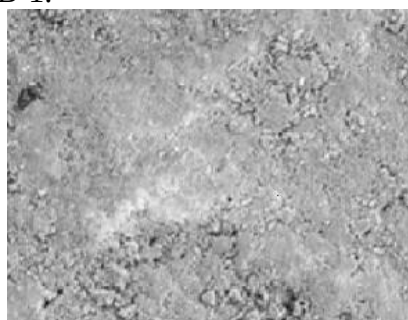


Fig. 5. Electron microscopic images of the 5-Fe-KR-1 sample: 1) without calcination; 2) after calcination at 500°C.

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Rezyume: Maqolada Krantau va Beshtyuben konlarining montmorillonitga boy gillari va ularning qatlamlari orasiga Fe^{3+} polioksokationlarini kiritish jarayonlari o'rganilgan. Rentgen fazaviy tahlil natijalari shuni ko'rsatdiki, tirqishsimon mikrog'ovaklarning o'lchamini tavsiflovchi d001 qiymat gilning singdirilish usuliga bog'liq. Birinchi usulda sintez qilingan namunalar uchun d001 qatlamlararo masofa mos ravishda Krantau va Navbahor bentonit namunalar uchun 15,1 va 15,7 Å, ikkinchi usul bo'yicha olingan namunalar uchun esa 13,7 va 14,3 Å. Ma'lum bo'ldiki, interkalyasiyalangan bentonitlar suv bug'iga nisbatan yuqori adsorbsion faollikni namoyon etib, gidrofob benzolga nisbatan kam faollikni namoyon qiladi, bu esa interkalyasiya natijasida gidrofil sirt guruhlari ortishidan dalolat beradi.

Резюме: Исследованы монтмориллонит содержащие глины Крантауского и Бештюбенского месторождений и процессы интеркалирования их полиоксокатионами Fe^{3+} . Результаты РФА показали, что величина d001, определяющая размер щелевидных микропор, зависит от способа проведения интеркалирования глины. Межплоскостное расстояние d001 для образцов, синтезированных первым способом, составляет 15,1 и 15,7 Å, соответственно для образцов Крантауского и Навбахорского бентонита, в то время как для образцов на основе второго способа имеют значения 13,7 и 14,3 Å. Установлено, что интеркалированные бентониты показывают повышенную адсорбционную активность по отношению к парам воды и несколько заниженную активность по отношению гидрофобному бензолу, что показывает повышение гидрофильных поверхностных групп в результате интеркалирования.

Kalit so'zlar: interkalyasiya, polioksokationlar, adsorbsiya, desorbsiya, izoterm, bentonit, montmorillonit, rentgen fazaviy tahlil.

Ключевые слова: интеркалирование, полиоксокатионы, адсорбция, десорбция, изотерма, бентонит, монтмориллонит, рентгенофазовый анализ.

**MINERAL PARASHOCK AND ITS INFLUENCE ON THE FORMATION OF THE
STRUCTURE OF BITUMEN EMULSIONS**

Abdikadirov P. U.¹, Korabaev A.M.²

¹Karakalpak State University named after Berdakh, ²Tashkent State Transport University.

Summary: *The article presents. Road pavement repair, priority use of bituminous emulsions, analysis of the state of design and estimate documentation and preparation of stable bituminous emulsions. Based on the results of the analysis, the mineral parashock and its influence on the formation of the structure of bitumen emulsions were studied.*

Key words: *Bitumen, bitumen emulsions, resins, tars, heavy oils, layer, mixture, emulsifier, cement.*

Introduction

Asphalt-concrete pavements are predominant among the main pavements. In most developed countries, the length of roads with such coatings is 90-95% of the total length of roads. Along with standard asphalt mixes, bituminous compositions are widely used in the construction and repair of roads, such as

Bitumen emulsions, complex binders (bitumen-polymer, bitumen-rubber, gray or rubber-bitumen, etc.). Alternative types of organic binders are used - resins, tars, heavy oils, etc. All this class of mixtures based on organic binders L.A. Gorelyshev combines under the general name of organomineral. Pavements made of organo-mineral materials have a number of technological and operational advantages. These are evenness, the possibility of providing the required surface roughness, short periods of repair and restoration work, the possibility of using local materials and manufacturability. However, all these types of road surfaces are characterized by frequent surface damage (cracks, microcracks, peeling, chipping, etc.), which leads to a deterioration in their performance properties, especially roughness and evenness. Repair of the road surface can be done either by strengthening the existing road structure, or by installing a surface protective layer. A more common method of repair is the installation of protective layers, because it does not require large expenditures of energy resources, the use of expensive equipment and a large amount of road building materials. It should be borne in mind that thin layers of conventional hot mix asphalt may not be possible due to their rapid cooling, loss of compaction and poor adhesion to the substrate. In world practice, a device has become widespread for these purposes thin-layer surface treatments from emulsion-mineral mixtures of cast consistency based on cationic bitumen emulsions, which differ from classical surface treatment both in the materials used and in the technology of work.

Main part

High requirements for binders (high adhesion, heat resistance, the need to spread them over the base surface in thin films) make it undesirable to use liquid and viscous bitumen in their usual state for many road construction works: surface treatment, thin protective layers, patching repair, crack filling, cold recycling, priming, laying of pavement layers according to the impregnation method, etc. For these types of work, bitumen in an emulsified state, which has a number of serious advantages, has found wide application.

The priority use of bitumen emulsions for surface treatment is emphasized in a number of works by L.A. Gorelyshev, M.I. Kuchma, I.A. Plotnikova, E.M. Rvacheva, E.A. Kazarnovskaya, M.F. Nikishina, V.A. Kharchenko, I.N. Petukhova and others. The authors note that emulsions provide:

- uniform distribution of the binder in thinner films over the surface of the layer, which reduces the likelihood of "sweating", the loss of roughness and contributes to a better envelopment of the grains of the mineral material by the binder;

- good fluidity of the binder;
- simplification of the production technology due to the possibility of using materials in a cold state;
- a very significant reduction in bitumen consumption;
- safety of application of bituminous emulsions in comparison with viscous bitumens;
- preparation of emulsion-mineral mixtures directly at the construction site;
- a sharp decrease in transportation costs for the transportation of materials;

- full implementation of surfactant properties, tk. there is no destruction of them during heating at the time of introduction into the mixture. The introduction of bitumen emulsions into the road industry is associated with constant rivalry between the usual costly methods of road work and new resource-saving technologies that require highly qualified workers, knowledge and compliance with the technological process at all stages to the smallest detail.

Materials and methods of research:

Considering that, in general, the use of emulsions and emulsion technologies instead of classical ones makes it possible to achieve significant savings in the production of road works, road managers in countries with a developed road network (USA, France, Germany, etc.) have long settled on an active their application. So, for example, in France, there are 100 emulsion plants evenly distributed throughout the country so that the distance over which the emulsion is transported in all possible cases does not exceed 50 km, and producing more than 1.2 million tons of emulsion per year.

When using emulsions in the road sector, economic efficiency is based on two factors: reducing energy consumption due to the "coldness" of technologies and saving binder. An example of this is the data obtained by Soyuz-dorNII for the technology of high-speed surface treatment using bitumen emulsion and cubic crushed stone, which allows achieving:

- reducing the consumption of binder (bitumen) by 10-12 (up to 20)%, i.e. for 630-675 kg/km of coverage;
- reduction of crushed stone consumption by 40-45%, i.e. for 31-38 m³/km of coverage;
- reduction of fuel consumption by 80% compared to asphalt concrete;
- increase in service life of surface treatment by 35-40%, ie. up to 5-6 years;
- increasing the service life of pavement by 20-22%, ie. for 2.5-3 years;
- improving the safety and comfort of motor transport traffic;

An analysis of the state of design and estimate documentation in the road industry allows us to conclude that the technical and technological solutions used in the documentation, as well as the road construction materials used, largely do not correspond to the current level of scientific and technical development. Decisions on the above issues practically do not differ from decisions 20-30 years ago. To ensure the design speeds and safety of road traffic, especially on modern highways, it is necessary to have a high operational quality of the upper "protective" layers of road surfaces. The upper layers must provide the necessary roughness and evenness, protect the underlying structural layers of pavement from atmospheric moisture, which is an indispensable condition for the durability of roads. The surface treatment device is the most important type of construction work in the maintenance of roads. To date, various methods of their construction have been developed. However, the most common method was and remains the method of single processing in the form of a rough wear layer. The accumulated experience has made it possible to fully and deeply study the nature and features of the operation of rough wear layers.

The use of thin-layer coatings in the repair of existing coatings in some cases seems to be the most appropriate. First of all, this is justified by the high cost and acute shortage of organic binders and high-strength hard-to-grind fractional crushed stone.

Results and discussion

The use of emulsions instead of hot bitumen simplifies the repair technology, allows work to be carried out in early spring, using a pre-prepared mixture. It is most advisable to use cationic bitumen emulsions for repairs, as they provide fast formation and good quality of work. Repair is carried out by surface treatment or impregnation, as well as using an emulsion-mineral mixture prepared directly during the repair period or prepared in advance and stored in a pile at the base.

1. To carry out effective repair of roads, as well as the device of the closing layers of road surfaces, it is necessary to develop technical and economic solutions for the use of emulsion-mineral materials and the proposed components in their composition.

2. To ensure the development of domestic road construction, it should go in the direction of introducing and adjusting advanced foreign technologies, taking into account the properties of local materials that differ from foreign ones in terms of their quality indicators, the availability of appropriate equipment and mechanisms, taking into account the peculiarities of domestic operating practices highways.

The preparation of stable bitumen emulsions is impossible without the use of surfactants with the necessary emulsifying and stabilizing properties. The suitability of the emulsion for a particular type of work largely depends on the type of surfactant. There are many chemical compounds that can be used to emulsify bitumen, but for technical and economic reasons, only a small number of them have become widespread. A significant portion of these compounds can be used alone or in combination with one or more other compounds. They can also be modified in various ways to obtain special properties. A good emulsifier, in addition to providing emulsions with appropriate properties, should be cost-effective, safe and easy to use.

The action of emulsifiers is to create a structural shell around the crushed bitumen droplets that does not break when they collide. Therefore, for the preparation of bitumen emulsions, emulsifiers are used, which, having surface activity, are adsorbed on the surface of drops, creating stable micelles that do not decompose in time. However, the role of the emulsifier is reduced not only to the formation of sufficiently strong protective films around the dispersed phase, its main role is to change the interfacial surface tension, i.e. the emulsifier, being adsorbed on the interface of liquids, should reduce the interfacial tension and thereby facilitate the emulsification process. Low surface tension favorably affects the stability of emulsions from a thermodynamic point of view.

Analysis

In bitumen-water emulsions, the emulsifier will mix to the interface between bitumen and water. The hydrophobic part of the emulsifier molecule retains interaction with the surface of bitumen particles, giving them ionic charges. The hydrophilic part of the emulsifier molecule is located in the aqueous phase.

There are three most common classification groups of bitumen emulsifiers: cationic, anionic and neutral (not having an ionic charge). Neutral or non-ionizing emulsifiers (i.e. emulsifiers that are surface active but do not ionize in solution) are of very limited use in the preparation of bituminous emulsions. Therefore, further we will consider the influence of only cationic and anionic emulsifiers.



Fig.2.1. Emulsions: a) anionic; b) cationic.

When ionic emulsifiers are introduced into water, they ionize and move to the surface of bitumen droplets, which are surrounded on all sides by the aqueous phase. The film, which is formed as a result of the combination of the hydrophobic parts of the emulsifier molecules on the surface of the bituminous part, gives the bituminous droplets an electric charge. The sign of this charge is determined by the charge of the hydrophobic or hydrocarbon part of the emulsifier molecule. If the negatively charged ions (anions) of the emulsifier possess. Hydrophobicity, then bitumen droplets will carry a negative charge, and the emulsion is called "anionic" (Fig. 2.1a). If cations or positively charged emulsifier ions are hydrophobic, then bitumen particles carry a positive charge, and the emulsion is of the "cationic" type (Fig. 2.1b).

In a cationic emulsion, positively charged ions are oriented relative to the surface of the bitumen droplets. Negatively charged chloride ions are attracted to the surface of droplets with positive charges and ions, forming a "double electric layer" (see Fig. 2.1) Lime (fluff, boiling water) and cement are considered effective and affordable activators.

An analysis of the literature on the use of lime in road construction for the preparation of asphalt concrete mixtures made it possible to establish that at present there are a number of conflicting opinions in this area. So, mineral powders for asphalt concrete, in accordance with the requirements of regulatory literature, may contain free CaO, MgO no more than 3% by weight. However, to enhance the adhesion of bitumen to the adhesive, a number of scientists advise the use of additives of surfactants and some inorganic substances, such as lime, cement.

According to the data, when an activator, fluff lime, is introduced into bitumen, an active salt form of surfactant is formed, which is chemically sorbed on the mineral surface. As a result of activating the surface of mineral materials with lime, not only better wetting and adhesion of bitumen is achieved, but also its faster mixing with wet mineral material. The experience of obtaining high-quality asphalt concrete with increased heat and water resistance when using hydrophobic lime is known. Lime was hydrophobized with hot bitumen during the grinding process. Hydrophobic shells on quicklime particles made it possible to maintain its activity for a long time. The introduction of hydrophobic lime into asphalt concrete in an amount of 2-2.5% made it possible to reduce the consumption of bitumen in asphalt concrete, increase strength, water resistance and shear resistance. It has been established that the activation effect depends on the moisture content of the mineral material, its mineralogical composition and the amount of the activator. It should be noted that lime - boiling water is about 1.5 - 2 times more active than freshly prepared lime - fluff and cement grade 400 - 500.

Conclusion:

An analysis of the literature data on the use of lime in asphalt concrete showed that it has a positive effect on the quality of asphalt concrete due to the active interaction of bitumen components. However, the mechanism of this interaction has not been sufficiently studied in the considered works. Noting the positive impact of lime, the authors consider the impact of existing lime-containing waste, without indicating the extent to which it has a positive impact.

That is, the range of lime content in asphalt concrete that has a positive effect on its characteristics is not known.

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Rezyume: *Maqola taqdim etadi. Yo'l qoplamalarini ta'mirlash, bitumli emulsiyalardan ustuvor foydalanish, loyiha-smeta hujjatlari holatini tahlil qilish va barqaror bitum emulsiyalarini tayyorlash. Tahlil natijalari asosida mineral parashok va uning bitum emulsiyalarining strukturasini shakllantirishga ta'siri o'rganildi.*

Резюме: *В статье представлены. Ремонт дорожного покрытия, приоритетное использование битумных эмульсий, анализ состояния проектно-сметной документации и приготовление устойчивых битумных эмульсий. По результатам анализа изучен минеральный порошок и его влияние на формирование структуры битумных эмульсий.*

Kalit so'zlar: Bitum, bitum emulsiyalari, qatronlar, smolalar, og'ir yog'lar, qatlam, aralashma, emulsifikator, sement.

Ключевые слова: Битум, битумные эмульсии, смолы, гудроны, тяжелые масла, слой, смесь, эмульгатор, цемент.

DIFFERENTIAL HEAT, ISOTHERM, ENTROPY, AND TIME OF TRIETHYLAMANE ADSORPTION ON ZEOLITE NH₄ZSM-5

Abdulkhaev T. D.¹, Guldasheva Sh. A.², Rakhmatkariyeva F. G.²,

¹Namangan Engineering-Institute of technology, ²Institute of organic and inorganic chemistry.

Summary: The differential heat of adsorption of triethylamine on the zeolite (NH₄)_{1.35}ZSM-5 isotherm at a temperature of 303 K was measured. Based on the results obtained, cations and adsorbate bonds near the surface of the zeolite (NH₄)_{1.35}ZSM-5 were elucidated in detail. The mechanism of adsorption of triethylamine from initial loading to saturation was elucidated in detail. The adsorption isotherm was described by the (theory of volumetric filling of micropores) TVFM equation.

Key words: isotherm, differential heat of adsorption, ionic-molecular complexes, zeolite (NH₄)_{1.35}ZSM-5, triethylamine, adsorption calorimeter.

Introduction. Justification of the following scientific solutions for the structure, synthesis of zeolites and their application in natural gas, wastewater treatment processes in the world, including: determination of molecular mechanisms of conformation, localization and adsorption of adsorbents by using non-polar n-heptane, polar water, methyl, ethyl alcohols, quadrupole carbon - (IV) oxide and aromatic benzene molecules; creation of the law of adsorption thermokinetics in the zeolite structure and development of technology is necessary.

In our republic, a lot of scientific research has been carried out in obtaining zeolites used in the purification and drying of natural gas, petroleum products from additives. In particular, significant theoretical and practical results are obtained on the determination of the active center of zeolites in a high vacuum adsorption-microcalorimetric device and the adsorption of molecules of various sizes, which are swallowed by cations located in the active center. It is also important to improve the technology of synthesis and application of zeolites used in the development of the chemical industry, purification and drying of natural gas, oil, petroleum products from additives, and the creation of new adsorbents based on active substances.

In this regard, the study of the adsorption mechanisms of triethylamine in the NH₄ZSM-5 zeolite is also important.

It is cited in the literature that some of the adsorbates cannot penetrate the zeolitic pore. The reason for this is explained by the size of the adsorbate molecule. Even in MFI and FAU-type zeolites, adsorbates with large molecules cannot penetrate into the pores. But, zeolite is also sorbed on surfaces in small quantities. This allowed us to study the effect on the properties of zeolites using sorbate molecules embedded in surfaces. Most of the times, the absorption spectra of molecules show an intensive range at 300 nm. To prove this theory, experimental work was carried out on adsorption of triethylamine to the studied zeolite samples [1]. In this way, the zeolites (sorbate molecules without existing protons to react) do not have a 300 nm range (almost complete), which confirms that the molecules react with the acidic centers of the zeolite.

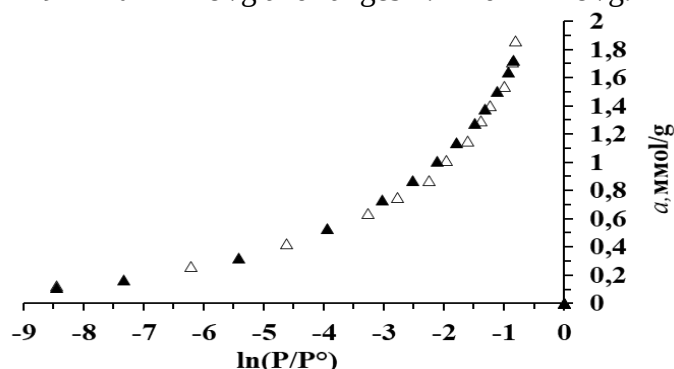
In Gamma-iron oxide samples, however, an adsorption-calorimetric method was used to study the adsorption of triethylamine at 30-100°C. From the analysis of thermokinetic curves, it was found that the adsorption process goes in two stages. With an increase in surface concentration, the values of the adsorption differential heat gradually fall into the heat of condensation, which indicates the uniformity of the surface of iron oxide. This surface has been shown to have both the formation of a hydrogen bond with surface hydroxyls and adsorption in Lewis centers of varying acidity [2].

The discontinuity of Ca-exchange forms of a number of synthetic phocasites in triethylamine adsorption relies on uncertain experimental evidence and may actually be an experimental approximate result [3].

Research methods and objects. For the study, the composition of the elemental cells of the obtained zeolite is $(\text{NH}_4^+\text{AlO}_2)_{1,35} (\text{SiO}_2)_{94,65}$. Triethylamine was selected to determine the adsorption surface of the zeolite.. Studies on triethylamine adsorption to zeolite were carried out in a high vacuum adsorption microcalorimetric device [4]

Adsorbates were first frozen and then cleaned in a vacuum pump and zeolites. The microcalorimeter allows you to measure the differential heat released over a long period of time. In the determination of adsorption measurements, carried out in a high vacuum adsorption device and calculated in a different way, the absorption of adsorbates in small quantities increases the accuracy of adsorption measurements

The triethylamine adsorption isotherm in the $\text{NH}_4\text{ZSM-5}$ zeolite goes at $P/P_s=0.87$, with almost saturation pressure $\alpha=19.2 \cdot 10^{-3}$ mmol/g and ranges $1.1 \cdot 10^{-3}$ mmol/g.

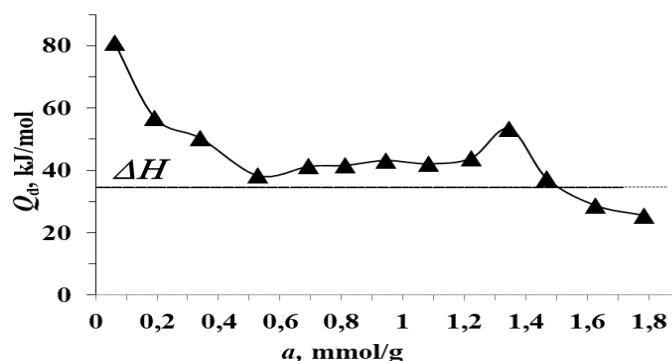


1- figure. Adsorption isotherm of triethylamine in $\text{NH}_4\text{ZSM-5}$ zeolite. Δ -experimental values, $\blacktriangle$ - points calculated through TVFM

The adsorption isotherm of triethylamine was determined by the BET equation at relative pressures from ~ 0.05 to ~ 0.45 , with the initial layer capacity equal to $\alpha_m=5.7 \cdot 10^{-3}$ mmol/g. The adsorption isotherm of triethylamine in the $\text{NH}_4\text{ZSM-5}$ zeolite is strong in the interaction of adsorbents and adsorbates at low values. Apparently, this triethylamine is associated with ammonium cations of the zeolite in the donor-acceptor molecule. Below is a graph of the adsorption isotherm of triethylamine at a pressure of $a=8.15 \cdot 10^{-3}$ mmol/g at a pressure of 57 Pa in the zeolite of $\text{NH}_4\text{ZSM-5}$. In this case, at small pressures, the adsorption of triethylamine to the active centers of the zeolite surfaces is observed.

The adsorption isotherm of triethylamine was analyzed using the Lengmyur equation (Figure 1). In this case, the monogamous capacity is characterized by $\alpha_m=0.02$ mmol/g, and the pressure range is characterized by an energetic leap from 13.3 to 86.6 Pa. Accordingly, the area of each triethylamine molecule can take up $\omega_m=0.57$ nm², and the specific surface area of $\text{NH}_4\text{ZSM-5}$ zeolite is ~ 3.0 m²/g, which is obtained as a result of triethylamine adsorption.

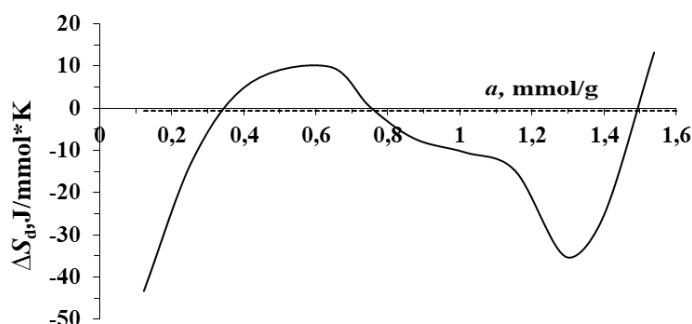
The adsorption differential heat curve of triethylamine in the sealite $\text{NH}_4\text{ZSM-5}$ has a stepped shape (2-figure).



2-figure. Triethylamine (C_2H_5)₃N adsorption differential heat in NH_4ZSM-5 zeolite at 303 K

In the first stage, the adsorption heat is reduced from 80 to 40 kJ/mol (0 to 1.22 mmol/m² in the adsorption area), and in the second stage from 40 to 37.3 kJ/mol (1.5 to 1.6 μj/mol in the adsorption region is reduced to 0.1 μj/mol 3.2 μmol/m²). The appearance of the first stage, according to the results of the study, is associated with the adsorption of the triethylamine molecule to ammonium cations of the zeolite. The second stage is adsorption in surface hydroxyl groups. Triethylamine molecules are attracted towards the cations of active centers located on the outer surface of the zeolite.

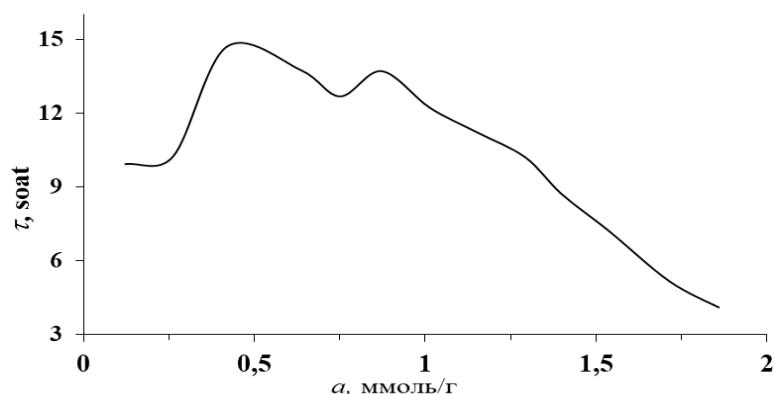
In the zeolite NH_4ZSM-5 , the entropy of adsorption of triethylamine molecules is shown in 3-Figure. The molar differential entropy of triethylamine adsorption is from -43.28 to -11.38 J/mol*K that is, an increase from a very small minimum to a sharply higher value means that adsorption is going on on the surface of the zeolite as described above. The entropy value of adsorption at values above -11.38 J/mol*K will also be higher than liquid state mobility. Trimethylamine adsorption of 0.4 mmol/g is higher than standard state entropy and goes from 0.35 mmol/g to 0.75 ranges.



3-Figure. Molar differential entropy of triethylamine adsorption at 303 K.

And the fact that the entropy value of the initial adsorption is small can be seen as the result of the mutual attraction of cations and triethylamine molecules close to the surface of the zeolite, such as the value of the initial differential heat. Thus, differential and integral entropy indicate that every single adsorbed trimethylamine molecules in the zeolite are in a mobile state. The mean integral entropy is -9.13 J/mol*K. Trimethylamine molecules adsorption occurs in wave form from the entropy graph.

In the NH_4ZSM-5 zeolite, the adsorption of triethylamine molecules comes into equilibrium (up to 1 mmol/g) is very slowly passed and then accelerated. In doing so, the balance time is reduced from almost 14.7 to 8.8 hours. In primary adsorption, it takes a considerable time for cations to bind relatively firmly to the triethylamine molecules with their location close to the outer layer (4-Figure.).



4-Figure. Adsorption equilibrium time of triethylamine molecules in $\text{NH}_4\text{ZSM-5}$ zeolite at 303 K.

In later stages, however, it is explained by the fact that molecules that are not adsorbed with molecules fully adsorbed between the triethylamine molecules remain in their vapor state as a result of the Ozoro action. Decreases to 1.85 hours when the process is completed

Conclusion: as a result of the research work carried out above, it was found that ammonium cations are not only inside the channels of the adsorbent, but also around its outer surfaces. It was found that the triethylamine molecule forms a mono layer in the adsorbent surface part and adsorbs to the pores in the surface part

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Rezyume: $(\text{NH}_4)_{1,35}\text{ZSM-5}$ seolitida trietilamin adsorbsiyasi differensial issiqligi izotermasi 303 K haroratda o'ldirildi. Olingan natijalar asosida $(\text{NH}_4)_{1,35}\text{ZSM-5}$ seolitining sirt yuzalariga yaqin bo'lgan kationlar va adsorbat aloqalari batafsil yoritib berildi. Trietilamin adsorbsiyasi boshlang'ich to'ldirishdan to to'yinishgacha bo'lgan mexanizm batafsil yoritib berildi. Adsorbsiya izotermasi MHTN (mikrog'ovaklarning hajmiy to'yinish nazariyasi) tenglamasi natijalari yordamida tavsiflandi.

Резюме: Измерена дифференциальная теплота адсорбции триэтиламина на цеолите $(\text{NH}_4)_{1,35}\text{ZSM-5}$ изотерма при температуре 303 K. На основании полученных результатов детально выяснены катионы и адсорбатные связи вблизи поверхности цеолита $(\text{NH}_4)_{1,35}\text{ZSM-5}$. Подробно выяснен механизм адсорбции триэтиламина от начальной загрузки до насыщения. Изотерму адсорбции описывали уравнением (теория объемного заполнения микропор) ТОЗМ.

Kalit so'zlar: Izoterma, adsorbsiya, differensial issiqlik, ion-molekulyar kompleks, $(\text{NH}_4)_{1,35}\text{ZSM-5}$ seolit, trietilamin, adsorbsion kalorimetr.

Ключевые слова: изотерма, дифференциальная теплота, адсорбция, ионно-молекулярный комплекс, цеолит $(\text{NH}_4)_{1,35}\text{ZSM-5}$, триэтиламин, адсорбционный calorimetr.

THE ECONOMIC ESSENCE OF COSTS AND SELF-COST OF PRODUCTION

Mirzanov B.J.¹, Saginbaev S.T.¹, Mamayeva D.K.²

¹*Karakalpak State University named after Berdakh,*

²*Ministry of Public Education of the Republic of Uzbekistan.*

Summary: *The article considers, analyzes and reveals the economic essence of costs and self-cost of production. The classification of expenditures has been systematized, which will make it possible from the point of view of financial and managerial accounting for the calculation of costs and cost management.*

Key words: *costs, prime cost, classification of costs, self-cost of production, expenses, production costs.*

Costs are the monetary expression of the cost of all resources spent on achieving (production of products, purchase of goods, provision of services, performance of work, implementation of projects) the intended goals. This term has many meanings, and different types of costs are used in different situations. For example, in manufacturing companies, many costs are associated with producing a product and selling it to customers. These include material costs, labor costs, depreciation costs for machinery and equipment, maintenance costs, food and medical expenses for employees, electricity costs, product storage, advertising, delivery to customers, salaries of managers, telephone costs. and internet and other expenses. The type and amount of expenses will depend on the characteristics of the organization, its size and other factors.

Costs reflect the cost of resources used in the course of the enterprise's activities for the production of products. The composition of the costs included in the cost of production is set centrally. Setting prices, expanding or narrowing the range, planning for further development, reflecting in financial statements, determining profitability and profitability of the enterprise - these are the main tasks of cost accounting as part of the cost of production. Therefore, the activities of any enterprise can be characterized by the costs incurred. In fact, they represent a reduction in economic benefits during the reporting period in the form of a deduction or reduction in assets outside the enterprise or an increase in liabilities, leading to a reduction in equity. Here are some definitions of the economic essence of expenses from the point of view of various scientists (Table-1)

Based on scientific sources (regulatory documents, scientific publications, etc.), it can be concluded that there is no unambiguous interpretation of understanding data at the moment. One of the main tasks of accounting is the disclosure of information about costs, their accurate coverage and display, and on this basis the unit cost of a product or service is calculated.

The costs of the enterprise have a different structure and functional state. They are determined by a number of factors, the main of which are: the type and nature of activities, the type and nature of the costs incurred and their inclusion in the cost of production [3]. From the point of view of accounting, the activities of the enterprise can be divided into main and auxiliary. The main activity is the one for which the enterprise was created, operates and therefore enters into relationships with third parties, obtaining results. For the successful participation and use of producers in the market, the price of the goods or services they offer is crucial. It should be such as to cover the costs incurred, as well as make a profit.

Table-1

Approaches to determining the economic essence of expenses

Tax Code of the Republic of Uzbekistan	"... the expenses associated with the receipt of income are recognized as reasonable and documented expenses (and in the cases provided for by Articles 333 - 336 of this Code, losses) incurred (incurred) by the taxpayer both in the Republic of Uzbekistan and abroad during the reporting (tax) period"
Tax Code of the Russian Federation	Reasonable and documented expenses (and in the cases provided for by Article 265 of this Code, losses) incurred (incurred) by the taxpayer are recognized as expenses. Justified costs are understood as economically justified costs, the assessment of which is expressed in monetary terms
International Financial Reporting Standards	"expenses represent decreases in economic benefits during the reporting period in the form of disposals or depletions of assets or increases in liabilities that result in a decrease in equity that is not attributable to its distribution to equity participants"
National Accounting Standards of the Republic of Uzbekistan	Expenses - reductions in economic benefits, reflected in the reporting period in the form of disposal, decrease in the value of assets or increase in liabilities, contributing to the decrease in equity (financial result), except for those related to its distribution among owners.
D. K. Shim, D. G. Siegel	an indicator in monetary terms of the amount of resources used to achieve a specific goal.
Ya.V. Sokolov	something that reduces an asset or increases a liability on the balance sheet (due to a change in valuation, or value flows or goodwill)
T. Malikov	the monetary value of resources used to make a profit or achieve other goals of an economic entity is called the expenses of an economic entity.
Sh.Shodmonov	money spent by the enterprise for the purposes of production, for the acquisition of economic resources.

Thus, one of the most important economic levers for ensuring competitiveness in the market is the cost of manufactured products and, accordingly, its basis is the cost of production. Cost is an important economic indicator of business activity and a means of regulating the production process. This is an important factor in the analysis of the activities of enterprises and directly affects the management decisions made. Its connection with production efficiency, quality and price of the offered products and services is undeniable. Therefore, its importance in the modern environment of a competitor is extremely high [2].

To produce one unit of a product, an enterprise spends a certain amount of money on the purchase of material (raw materials), energy, machinery, fuel, workers, taxes, sales, etc. All these costs ultimately give a general indicator of the funds spent, which is called the cost of production (works, services). These are the costs of the enterprise aimed at the production of products (works, services) and its delivery to the consumer. In other words, we are talking about the valuation of production costs. It is determined exclusively in monetary terms and has various types. The cost structure may vary depending on various reasons, for example [4]:

- from seasonality (in summer you do not need to pay for heating an office, warehouse or store, and in winter this is one of the important items of expenditure);
- when changing the assortment policy of the enterprise (the production of a new range of goods requires additional costs);
- when changing a supplier who can offer raw materials or goods both cheaper and more expensive, of different quality.

The structure of the cost of production at enterprises operating in different industries varies significantly: for example, the cost of production of a construction company is formed differently than, say, the cost of production of a dairy plant. This indicator affects the formation of prices, on which, in turn, demand and final profit depend. The task of the head of the enterprise is to achieve maximum business efficiency, reduce product costs, but not reduce quality. Each enterprise in practice calculates this cost for production planning and taking into account the mass of the finished product in two ways:

- by economic elements of expenses (the cost of all products);
- according to unit cost calculations.

All funds spent on production before the finished product is delivered to the warehouse show net factory value. But they still need to be implemented, which also comes at a cost. Therefore, in order to get the full cost of production, they still have to add the cost of sales. These can be, for example, transport expenses, wages of forwarders who took part in the transportation and delivery of products to the customer, etc.

With regard to the relationship between cost and production costs, the specialized literature on the categories "production costs" and "production costs" is sometimes considered as identical. Of course, such statements are not only unfounded, but also unacceptable for a number of reasons:

- the cost of products and services is expressed only in value, while production costs can be presented not in value, but in kind, and in some cases with the help of a labor meter;
- The cost of products and services is established on the basis of the costs incurred, but it does not include all production costs incurred by the enterprise in a given period, or for a product or service.
- The cost of products and services is established on the basis of the costs incurred, but does not include all production costs incurred by the enterprise in a given period, or for a product or service.

Although there is an inextricable link between the categories of "production costs" and "cost", they differ both in content and definition.

The connection between production costs and value, which can be direct and inverse, is based on the fact that both comparable categories are "dialectical forms of the dual beginning of a certain economic content, such as necessary costs and exchange costs" [6]. This indicates that it can be searched in several directions:

- between production costs and costs as economic categories;
- between production costs and prime cost as economic indicators;
- between the cost of production and the cost of production as objects of management accounting;

- in the value of the cost of production, which depends on the volume of output;
- in the cost structure and the impact on the type and composition of production costs [5].

With a more thorough analysis of the relationship between costs and cost, the following are established and slightly specified:

- the cost of the cost of production is determined by the quantitative size of the cost of production;
- the cost of the structure is in a certain dependence on the cost of production;
- since production costs are expressed in kind, the cost and cost structure can change at constant costs only as a result of pricing policy.

The cost of production is an economic category, but also an important economic indicator that shows the profitability of the enterprise. Its size depends on changes in market conditions and shows how competitive the company is. It is therefore important that value as a measure be clearly distinguished from value as a category. Consider the main differences between the cost as an indicator and economic category:

- the “cost price” indicator is mainly associated with the quantitative side of facts and phenomena, while the “cost price” category expresses production relations (general economic and socio-economic) and, along with a quantitative one, also has a qualitative characteristic;
- the indicator "cost" is a characteristic indicator of quality and may include elements of the product produced (under certain conditions), while the category "cost" does not explicitly disclose the elements of the product produced;
- the indicator "cost" is the most frequently regulated digital expression of certain facts, phenomena and processes, while the category is an abstract logical form to reflect the objective world.

In the current economic conditions, it is important that the prices of goods and services are competitive in the market, and this requires the development of ways to reduce the cost of goods and services. That is why manufacturers are studying the sources and factors that affect the cost of production in order to minimize it.

In conclusion, it can be summarized that the cost of products and services is an important economic category and an indicator that characterizes significant aspects of the efficiency of the production process. It is the basis for pricing and has a significant impact on the competitiveness of enterprises in the market. It is also the main factor in the analysis of the activities of individual structures, which makes it of great importance for making managerial decisions. In the accounting aspect, it finds application in the measurement of specific elements displayed in the structural parts of the financial statements and creates conditions for a true and fair presentation of information. Therefore, knowledge and use of this powerful tool will help expand and strengthen the market position of the enterprise and business activity.

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Rezyume: Maqolada xarajatlar va ishlab chiqarish xarajatlarining iqtisodiy mohiyati o'rganiladi, tahlil qilinadi va ochib beriladi. Xarajatlar tasnifi tizimlashtirilgan bo'lib, bu moliyaviy va boshqaruv hisobi nuqtai nazaridan xarajatlarni hisoblash va xarajatlarni boshqarish imkonini beradi.

Резюме: В статье рассматривается, анализируется и раскрывается экономическая сущность затрат и себестоимости продукции. Систематизирована классификация расходов, что сделает возможным с точки зрения финансового и управленческого учета расчет затрат и управление затратами.

Kalit so'zlar: xarajatlar, asosiy tannarx, xarajatlar tasnifi, ishlab chiqarish tannarxi, xarajatlar, ishlab chiqarish xarajatlar.

Ключевые слова: затраты, себестоимость, классификация затрат, себестоимость продукции, затраты, производственные издержки.

CHANGES IN THE DYNAMICS OF FREIGHT AND PASSENGER TRAFFIC IN RAILWAY TRANSPORT IN UZBEKISTAN

Isaev A.A.¹, Embergenov N.J.²

¹Andijan State University, ²Karakalpak state university named after Berdakh.

Summary: the article analyzes the changes in the dynamics of freight transport in Uzbekistan in 1990-2020, including the indicators of transit cargo transportation. Also, the situation in passenger traffic and passenger turnover was revealed through this network.

Key words: rail transportation, freight transportation, passenger transportation, freight turnover, passenger turnover, transit, population

Introduction: During the years of Independence, the volume of cargo transportation on the Republican Railway has undergone specific changes. By the volume of cargo transportation, rail transport occupies the next place after road transport. During the years of independence, it can be seen that the share of railway transport in freight transport has regularly decreased. Railway Transport is distinguished by its ability to transport cargo and passengers over long distances in large quantities, its advantage over road transport in environmental terms. The development of Railway Transport has a rapid and significant impact on the socio-economic development of the regions. from where the railway passes, new settlements of the population, industrial enterprises, various production and service facilities of working places will be built in the same place.

The main part. In 1990, 22.5 percent accounted for 10.3 percent of the total transported cargo in the Republic in 1991, while in 2000 its share reached 15.2 percent, and in 2015 only 4.7 percent of the total cargo transported in transport corresponded to the railway. Another aspect is that the years under study the transport cost of rail transport has increased. In particular, despite the fact that in 2020 the contribution of this network was 5.1%, it can be seen that this figure increased by almost 105.0% compared to 2015 by 166.6% compared to 2000. Another aspect is that in 2015, the cargo transported by rail was 19.2% when transporting these goods, which were 13445.3 thousand tons, while 91.9% of the cargo entering the territory of Uzbekistan was transported by rail transport. The volume of incoming cargo was 12,278.2 thousand tons. By 2019, a total of 18,014.1 thousand tons of cargo had gone out, while 23,054. 9 thousand tons of cargo had entered. The proportion of rail transport was equal to 19.8 percent and 80.8 percent, respectively. Due to the pandemic in the world of 2020, 45.8 percent of the cargo that left the territory of Uzbekistan during the restrictions, and 83.5 percent of the incoming cargo falls on the hiss of rail transport. Statistics also show that when sending goods over long distances, rail transport, competing with pipeline transport, leads to the import of cargo into the territory of Uzbekistan (Table 1).

Table 1. Transit cargo transportation through the territory of the Republic of Uzbekistan

	2015	2016	2017	2018	2019	2020
Total of transit shipments, (thousand t)	31974,9	33 992,4	35 288,7	39 114,0	38 553,8	39 906,6
Including by types of transport						
By rail	7545,7	7 976,6	7 675,1	7 270,9	7 037,5	8194,9
On motor transport	494,3	459,2	397,0	620,9	696,2	714,7
By pipeline transport	23934,9	25 556,6	27 216,6	31 222,2	30 820,1	26896,0

From the analysis of the data presented, it should be said that the indicators of the main activity of railway transport in freight transport have acquired a tendency to increase, and a positive

assessment of such a situation can be predicted that mokin, at the same time, has consistently increased cargo transportation indicators in rail transport, and this Dynamics will remain even in

In 1991-2017, specific changes also occurred in freight turnover on the railway. In particular, in 1990, when independence was declared, the volume of freight turnover by rail transport amounted to 56.0 billion.tons km.ni as of 2015, this figure is 22.9 mlrd.ni the total freight turnover for rail transport between 2015-2020 was on average 26-22 Billion t/km.

In particular, the growth rate of railway freight turnover in 2015-2020 was an average of 100.5 percent. In turn, the share of rail freight turnover in total traffic turnover also decreased. If in 1991 this figure was 47.1 percent, in 2015 it was 35.2 percent, in 2019 it was 35.8%. In general, it can be seen that in 2015-2019 the freight traffic on the railway increased by 102.2%. At the same time, the increase in the share of rail transport in the cargo turnover of the transport system can be assessed as a positive situation, since the cost of freight transport in rail transport is 3-5 times cheaper than in road transport, taking into account the fact that the bulk of goods and services produced in our country are transported by territorial differences in passenger traffic and its turnover can be explained by natural, socio-economic factors. In the first place, this was greatly influenced by such factors as the number of inhabitants of the studied areas, the coefficient of mobility of the population, the density of the population, the crossing of Railways, the location of the nearby railway station. The pace of passenger traffic is observed in more than 200,000 population cities Tashkent, Samarkand, Andijan, Namangan, Fergana and districts with a population of more than 130,000 people. previous state after the removal of pandemic restrictions.

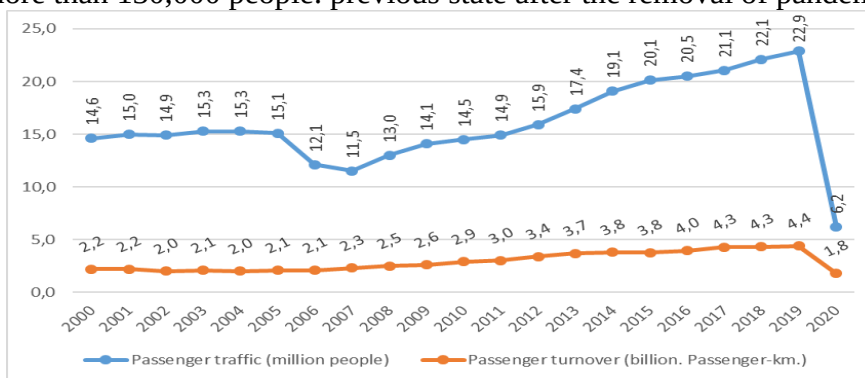


Figure 1. Dynamics of passenger traffic of railway transport in Uzbekistan

In the first decade of independence (1991-2000.) in this type of transport, passenger traffic was reduced by 6.4%. In the next decade, this number was 0.7 percent. And since 2010 it can be seen that the number of passengers transported by rail transport is increasing (fig. Rail transport corresponds to 0.3% of the total number of passengers transported in all types of transport. In 2020, the share of passengers transported in all transport was 0.1%, and this figure returned to its In 2000-2020, specific changes were observed in the passenger turnover of railway transport. In particular, the passenger turnover of the railway in 2000 was 2.2 billion lovchi-km.ni by 2015, this figure increased by 1.4 times. In particular, passenger turnover in 2000-2019 amounted to 2.2 billion.passenger km.from 4.4 billion in 2019.passenger km.ga. did. It can also be observed that the share of passenger turnover in the total passenger turnover in rail transport has also decreased. In particular, in 2000, the share of passenger turnover in rail transport amounted to 7.0% of the total passenger turnover, while in 2019 this figure fell to 3.1%. It is necessary to note separately that the growth rates of passenger turnover in rail transport amounted to an average of 105.0 percent, while the growth rate in the last 2020 fell by 2.4 times.

As a result of the studies, the following conclusions can be drawn: 1. During the period of study of freight traffic in Uzbekistan, the share of this network did not fall sharply even during the pandemic. Even during the pandemic period, it has not lost its relevance as the most effective means of transporting goods to foreign countries. 2.Despite the high demand for passenger transport and

rail transport in the passenger turnover in Uzbekistan, there is a need to carry out reforms in the industry. In this regard, when connecting large cities of Uzbekistan, improving the territorial structure of domestic tourism, it is necessary to take into account the high network capabilities, especially when developing an effective mechanism for transporting transit goods by rail.

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Rezyume: *Maqolada O'zbekistonda temir yo'l transporti 1990-2020 yillarda yuk tashish dinamikasidagi o'zgarishlar, jumladan tranzit yuklarni tashish ko'rsatkichlari tahlil qilindi. Shuningdek, mazkur tarmoq orqali yo'lovchi tashish va yo'lovchi aylanmasidagi holat ochib berildi.*

Резюме: *в статье железнодорожный транспорт в Узбекистане проанализированы изменения в динамике грузоперевозок за 1990-2020 годы, в том числе показатели транзитных перевозок грузов. Также раскрыта ситуация с пассажирскими перевозками и пассажирооборотом по данной сети.*

Kalit so'zlar: *temir yo'l transporti, yuk tashish, yo'lovchi tashish, yuk aylanmasi, yo'lovchi aylanmasi, tranzit, aholi manzilgohlari*

Ключевые слова: *железнодорожный транспорт, грузоперевозки, пассажирские перевозки, грузооборот, пассажирооборот, транзит, населенные пункты*

**PRIORITY AREAS FOR THE DEVELOPMENT OF TOURISM SERVICES IN THE
REPUBLIC OF KARAKALPAKSTAN ON THE BASIS OF PUBLIC-PRIVATE
PARTNERSHIP**

Khalmuratov K. P., Allamuratova P.
Karakalpak state university named after Berdakh.

Summary: *This article examines the forms of public-private partnerships and ways to improve them in the service sector of the service sector of the region.*

Key words: *Region, public-private partnership, public-social partnership, project, infrastructure, service sector.*

It is known that under certain conditions, the availability and concentration of a large number of tourist resources in any region leads to an increase in the potential of industries, regions and enterprises operating in this area. In particular, the attractiveness, the reputation of the region as a whole, the attractiveness of natural, material, technical, financial, labor, organizational, social and other resources in the region, as well as opportunities for their sale and reproduction, the availability of historical and architectural sites, favorable environmental conditions, the presence of attractive climatic conditions and other conditions contribute to the development of certain forms of tourism.

According to our analysis, the Republic of Karakalpakstan has the greatest resource potential for the development of tourism services and the hotel industry on the basis of the PPP mechanism. Today in Karakalpakstan there are 63 accommodation facilities (including 32 hotels, 4 hostels, 4 grass camps, 23 guest houses, the total number of rooms in them is 695 and the number of seats is 1460), 34 tour operators, 288 cultural heritage and pilgrimages. fields are available. Of ^[1] Data of the State Statistics Department of the Republic of Karakalpakstan and the Department of Tourism Development

these, 131 archeological sites, 24 architectural sites, 88 monumental sites and 45 attractions were recognized as tourist attractions. There are also 11 sanatoriums, 11 and 1 museum ^[1] (Sultan Uvays Memorial Complex, Savitsky Art Museum, Mizdaxkan Architectural Complex, etc.).

The administration of the Republic of Karakalpakstan believes that the main directions of state policy in the field of tourism should be the development of access and domestic tourism.

As well as the Karakalpak economist, Ph.D. Alimov AK also wrote dissertations for his doctoral dissertation in the districts and cities of the region, the Lower Amudarya State Biosphere Reserve, Sultan Uvays Mountain, Ustyurt Plateau, Sudoche and Saigachi, as well as the development of tourist routes based on the ecotourism potential of the Aral Sea. (METH) studies that improving the model of ecotourism development through the use of tourism will lead to the creation of new species, expansion of territories, development of infrastructure, increase of ecological culture, employment and income, as well as balance between nature and tourism. ^[2].

However, today the existing tourist potential of the Republic of Karakalpakstan is not used enough. In particular, Ellikkala, Kongirat, Turtkul, Khojayli, Amudarya districts, the city of Moynak, which has changed beyond recognition over the past 2 years, has a great potential for tourism development and requires their effective use.

It is necessary to study the experience of foreign countries in promoting the tourism potential of Karakalpakstan on the basis of the PPP mechanism, effective use of electronic advertising and commercial marketing, coverage of various interesting topics on tourism potential in the country on national and international social networks.

The development of tourism in the region on the basis of the mechanism of PPP developed according to the results of the SWOT analysis, the strengths of the tourism development in Karakalpakstan PPP in all areas of the tourism sector, in particular, direct implementation of

normative legal base, the abundance of historical sites and recreational resources, exhibits called "Desert Louvre" The existence of the Savitsky Art Museum, the only one of its kind in Central Asia; the presence of various relief, hydrogeological, balneological resources, water bodies, lakes, ornithological reserves, rivers, sea, historical archeological monuments.

Alymov A.K. The main directions and prospects of ecological tourism development in the Republic of Karakalpakstan. Doctor of Philosophy (PhD) dissertation in economics. Samarkand. 2018.

We conducted a SWOT-analysis of the tourism services sector on the basis of the PPP, developed on the basis of the strategy of socio-economic development of the Republic of Karakalpakstan (see Table 1).

Table 1.

SWOT-analysis of the development of tourism services in the Republic of Karakalpakstan on the basis of the mechanism of PPP^[3]

STRENGTHS	WEAKNESSES
- Existence of a regulatory framework for the introduction of PPP in all areas, in particular, directly in the field of tourism; - Abundance of historical monuments and recreational resources; - The existence of the Savitsky Museum of Art, the only one in Central Asia in terms of the number of exhibits called the Louvre in the Desert; - the possibility of attracting tourists from Iran and other countries to Europe via Kazakhstan, Russia and other countries by road and rail, and through Turkmenistan; - ecological, archeological and gastronomic tourism services;	- Lack of sufficient qualified, professional staff, advanced entrepreneurs to know the mechanism of PPP and its legal framework and its application in the field of services; - Insufficient development of transport services, tourist services, infrastructure on the basis of PPP ; - PPP mechanisms to use in the field of tourism because of the informal sector share of narrow high; - lack of road and roadside infrastructure at tourist facilities or absence of SGS around facilities; - non-coverage or unsatisfactory coverage of advertising and information materials on tourism in the region, in particular ecotourism, in international and national electronic and traditional media;
OPPORTUNITIES	RISKS (Threats)
- Transfer of facilities in the Lower Amudarya Bioreserve to businesses on the basis of the mechanism of PPP; - Development of hotel, hotel, motel, camping services in Elikkal, Kungrad, Turtkul, Khojayli, Amudarya districts with high tourism and recreational potential on the basis of the PPP mechanism; - Opportunities for the development of medical tourism through the rehabilitation of balneological sanatoriums in Karakalpakstan on the basis of PPP; - Opportunities for the development of extreme, travel tourism in the desert zones and the Ustyurt Plateau on the basis of the PPP mechanism ; - Development of transport services based on the PPP mechanism	- Risk of ruthless use of nature by entrepreneurs in the Amudarya Reserve and riverbanks on the basis of the mechanism of PPP; - threats to the state of flora and fauna in coastal landscape reserves and bioreserves due to water depletion; - the risks of foreign tourists entering the region due to economic and political instability in neighboring countries; - restrictions on investment in tourism due to stratification or rising unemployment; - the current development trend of the services sector may lead to further strengthening of the informal sector in the future.

In turn, the weaker aspects of PPP know the legal framework and the mechanism of its services in the field of application of qualified professional staff, the best entrepreneurs, PPP lack of transport services, tourist services, based on the type fratuzilmaning adequate development of the tourism industry PPP enough to use the mechanism of the informal sector because of the narrow - the high proportion, the lack of road and roadside infrastructure in the tourist facilities, or the absence of SGSs around the facilities.

In addition, the lack of coverage or unsatisfactory coverage of tourism and advertising materials in the region, especially in the international and national electronic and traditional media, environmental conditions in the region, poor drinking water and high salinity.

According to our analysis of the risks in the development of the sector on the basis of the mechanism of PPP, the risks of unsustainable use of nature by entrepreneurs in the Amudarya Reserve and riverside facilities, the deterioration of flora and fauna in coastal landscapes and bioreserves.

We also risked the influx of foreign tourists to the region due to economic and political instability in neighboring countries, restrictions on investment in tourism due to stratification or rising unemployment, the current trend in the development of the services sector and the future growth of the informal sector.

In addition, in this direction "Saiga festival in Ustyurt", "Journey to the island"; "Ustyurt" Paris-Dakar"; "Ancient fortresses of Karakalpakstan"; It would be expedient to create new tourist routes, such as "Amudarya three days", "Journey to Badaytuqay".

In order to further develop tourism services in Karakalpakstan on the basis of the PPP mechanism, a number of regional and national issues need to be addressed. In particular, given the insufficient use of unique cultural and historical heritage sites and recreational resources in the region, the PPP mechanism is based on the PPP mechanism. it is necessary to develop new tourist routes.

In order to effectively use the potential of medical tourism in Karakalpakstan, it is necessary to market many existing sanatoriums, develop substantial business projects to restore or strengthen their existing ones, transfer them to entrepreneurs on the basis of PPP or direct funds from the Resorts Department of the Federation of Trade Unions of Uzbekistan. .

Relevant organizations should carry out timely and regular repairs of cultural heritage and architectural objects. At the same time, there is a need to provide the area with roads and other infrastructure facilities leading to historical monuments.

In general, the implementation of measures to develop the service sector in Karakalpakstan through the use of the mechanism of PPP in the tourism sector, in particular, the development of road and roadside infrastructure, petrol, methane propane filling stations per km, including trade, catering, PPP, the construction of motels, hostels or hotels, in addition to existing programs, will be able to launch more than 4 thousand infrastructure facilities and create more than 15 thousand new jobs.

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Rezyume: *Ushbu maqolada mintaqa xizmat ko'rsatish sohasida davlat-xususiy sherikchiligining shakllari va ularni takomillashtirish yo'llari xususida so'z yuritiladi.*

Резюме: *В данной статье рассматривается формы государственно-частного партнёрства и пути их совершенствования в сфере услуг региона.*

Kalit so'zlar: *mintaqa, davlat-xususiy sherikchilik, davlat-ijtimoiy sherikchiligi, infratuzilma, xizmatlar sohasi.*

Ключевые слова: *регион, государственно-частное партнёрство, государственно-социальное партнёрство, инфраструктура, сфера услуг.*

UDC 551.40(575.1)

**THE MAIN DIRECTIONS IN THE CHANGE OF THE LANDSCAPE-ECOLOGICAL
CONDITIONS OF THE ADYRS OF THE FERGANA VALLEY**

Mirzamahmudov O. T.
Namangan State University

Summary: *The adyrs of the most densely populated Fergana Valley of the Republic of Uzbekistan are considered the main land reserve for agriculture. The presence of favorable natural geographical conditions and landscape complexes for the development of agriculture and various industries and recreation systems of these adyrs have led to a number of changes in the natural landscape complexes under the influence of anthropogenic factors. They were mainly manifested in the forms of formation and development of anthropogenic landforms, changes in soil cover, and development of agricultural -landscapes.*

Key words: *adyrs, adyr landscapes, anthropogenic relief, relief forms, soil cover change, agricultural landscapes, development of agricultural landscapes, effective use of nature, meso-relief, erosion, soils, natural-anthropogenic systems.*

Introduction

In the Fergana Valley where one of the most densely populated areas of the Republic of Uzbekistan, the adyrs are considered the main land reserve for agriculture. As there are favorable natural geographical conditions and landscape complexes for the development of agricultural sectors and various industries and recreation systems, the natural landscape complexes of these adyrs have been highly changed under the influence of anthropogenic factors [8]. From this point of view, the landscape-ecological condition of the adyrs of the Fergana Valley has undergone a number of changes under the influence of various branches of human economic activity, especially agriculture. Studying such transformational processes from the point of view of effective use of nature is considered one of the urgent tasks of today.

Analysis and results

Under the influence of anthropogenic activity, natural relief forms are changing. According to the degree of relief change, the Fergana Valley is divided into very little changed (20%-40%), moderately changed (40%-60%), strongly changed (80%-100%) areas. Genetic categories of anthropogenic terrain are divided into amelioration, quarry, terrace, leveled, construction, ravine suffusion-karst, irrigation-erosion, irrigation-accumulative and residual "subject" genetic groups [6].

Adyr landscapes of the Fergana Valley have anthropogenic landforms in predetermined or undefined forms depending on the purpose.

Predefined landforms include reclamation (drainage canals, irrigation canals, reservoirs, ponds, rice paddies), quarries (formed by excavation of adyrs and road construction), leveled, terraced slopes (slopes, terraces), devices (roads, flood dams, wind erosion barriers).

1. Reclamation relief. It results from the construction of irrigation facilities and secondary forms of irrigation. Under the influence of irrigation and drainage reclamation, the surface of the earth undergoes certain changes. Among them are canals and ditches connected with the release of water to the territory, and collector ditch structures built in the territory. The geography of channels and collector-drainage areas depends on a number of natural geographical factors. Irrigation systems are considered to be meso-relief forms, their occurrence is associated with changes in certain meso- and micro-relief forms.

2. Careers. Minerals are produced by open pit mining, excavation of foothills and erosion of the land as a result of road construction. F. N. Milkov distinguishes three main groups of quarries (quarry, restored and century state) [4,5].

3. Artificial terrace relief. It is formed as a result of the construction of artificial terraces and gardens on the slopes of the territory. Such areas are built according to the flow of water along the horizontal lines. It is a pity that farming is not carried out in the pre-mountain landscapes of Ferghana Valley, creating a terrace relief, which is causing great damage to the adyrs.

4. Flat terrain. Land leveling is divided into capital (fundamental) and current leveling. Both methods are implemented on old irrigated and newly irrigated lands. In the development of adyrs, it is required to carry out capital and current leveling works on the basis of the project. Leveling works are carried out on the basis of horizontal slopes and topographical surfaces. To level the adyrs, it is necessary to take into account such features as the granulometric composition of the soil group, the degree of leveling, the relief, the depth of the impermeable layers. According to the information provided by "The Ministry of water resources of the Republic of Uzbekistan" Institute, it is not recommended to carry out smoothing works on the lands with a thickness of 100 cm of soft rocks, the thickness of the leveling layer is 50 cm, and when the thickness of soft rocks is 50-100 cm. When leveling adyrs consisting of thick loess and loess-like rocks, this recommendation loses its validity. Because the surface of the existing loess adyrs with a thickness of 1-2 m to 4-5 m is being leveled using powerful techniques. This leads to a radical change of relief forms.

As a result of inspections and land leveling works in the Kokumboy adyrs, 20,000 tons of soil with a volume of 13,500 cubic kilometers were removed from an area of 5,000 square kilometers. The pushed soil was carried away into the valleys and depressions, causing the formation of suffocation and mounds. Anthropogenic ravines are caused by improper use of water in the adyrs and mistakes in choosing the type of place. As a result of irrigation of sloping lands, the bottom of the slopes is eroded. Improper use of water in the development of adyrs leads to the formation of collector-drainage ravines. A clear example of this is the huge ravine that divides the village of Kazanbulok, which belongs to the Yangikurgan district. Local residents say that there used to be many springs in this place, and the water flowed in a small stream. In 1976, after water was released to the adyrs, waste water appeared. On top of that, the filtered water accumulated on the impermeable layers and began to leak towards the village of Kazanbulok in the form of seeps. The level of the ground waters has risen in this village between the adyrs, and swamps have appeared. Local residents decided to dig a collector in order to reduce the level of seepage water. As a result, first smaller, then 15-20 m wide and 12-18 m deep ravines appeared. In some places of the ravines, tributaries with a length of 50-100 m have formed. The village of Kazanbulok was divided into two, parks, buildings, electricity networks and roads were destroyed [6]. Such unpleasant scenes can also be found in Chartak, Chust, Kosonsoy adyrs.

As a result of the change in the soil cover of the adyr landscapes of the Fergana Valley, landscape-ecological conditions also change and completely new landscape types appear [1,2].

Adyr landscapes are the main land fund of the Fergana Valley, and along with ecological problems related to the agricultural sector, changes in the soil layer are also observed in the area. Its main directions are manifested in the change of humus, turning it into cultural soil, salinization, erosion and other forms.

The emergence of such processes directly depends on the geological, geomorphological and soil conditions of the place, as well as mainly on the characteristics of anthropogenic factors.

In irrigated gray soils, due to agricultural-irrigation deposits, organic and mineral fertilizers, the thickness of the soil increases, gypsum is further washed down, the forms of nitrogen absorbed by plants increase, and the soil becomes increasingly cultivated. The areas where these soils are distributed have an average slope of 8-15⁰, and this slope is one of the main factors causing irrigation erosion. When irrigation is used to irrigate crops on sloping land, the fertile part of the

soil is washed away as a result of the increased velocity of water spread over the fields. As a result, soils with different fertility and other properties are formed.

According to historical sources, gravelly landscapes were covered with soft rocks in ancient times. Their irrational use led to the washing away of soft rocks on the surface of these soils.

Typical and pale gray soils are widely used in agriculture, including irrigated agriculture. As a result of their development, newly irrigated typical and irrigated light gray soil types were formed.

Long-term cultivation of irrigated gray soils has led to the formation of gray oases. Humus content of irrigated gray soils decreased in the first years of development, and then increased. The continuation of exploitation causes the leaching of carbonates and gypsum, the fertile soil thickens, and the amount of agronomically valuable substances increases. At the same time, leached carbonates and plasters have a negative effect on other areas, causing some agricultural lands in the lower regions to become unusable [7,8,9].

Irrigation erosion is common in irrigated agricultural areas. For this, all natural and anthropogenic factors have developed in the adyrs. There is a strong risk of erosion in the areas. As a result, the upper soft rock layer of the soil is washed away and the gravel layer is exposed. As a result, the water-climate regime and fertility of the soil deteriorate sharply, and it becomes completely unsuitable for agriculture. Irrigation erosion reduces soil fertility, seriously hinders timely agricultural operations, reduces cotton yield and quality, and causes leaching of applied mineral fertilizers (Table 1).

Partial wind erosion (deflation) is observed in the southwest of the adyrs. Chust-Pop foothill plains are seriously damaged by wind erosion. The reason for this is that it is not located in the direction of the Kokand-Bekabad wind, but the pressure over the Syr Darya riverbed diverts a certain part of the wind in this direction.

As a result, the properties of the front sloping plains of hilly landscapes are completely deteriorated due to the deflation of soils with a light mechanical composition.

One of the ways to combat deflation is to place the edges of irrigation fields across the direction of the wind, and to build tree groves of willow, acacia, mulberry, linden, poplar, apricot.

Table 1

Effects of irrigation erosion on soil fertility

Level of soil leaching	The slope of the land (°)	The thickness of the humus layer (cm)	Amount of compost (%)	Cotton crop (cen /hec)
The place where the washed product is collected	0°	More than 100	1,3-1,7	32,7
Less washed Pale gray soil	1-2°	50	1-1,2	28,4
Medium washed	3-4°	25-30	0,8-0,9	25,9
Strongly washed	5-7°	15-20	0,4-0,6	23,0

Note: The table was prepared based on the data of A. Maksudov.

Improper use of water in Adir landscapes, i.e. deterioration of the condition of collector-water systems, use of brackish water for irrigation causes secondary salinization.

The change of hilly landscapes of the Fergana Valley under anthropogenic pressure is in turn related to the features of relief exposure (slope), rock density, water permeability and other factors [3]. . Development based on scientific recommendations that take into account the condition of the relief, the composition of the rocks and the forms of the impermeable layer, the preservation of landscapes and the improvement of the agrotechnical method of irrigation, and the improvement of the reclamation condition of irrigation facilities are among the important tasks.

It is necessary to carry out the following activities in order to improve the cultural level of

the adyr landscapes of the Fergana Valley, to develop measures for soil desalination, to maintain soil fertility, and to prevent unpleasant ecological problems in anthropogenic landscape complexes:

- Increasing the area of crops with low water demand in the hilly landscapes of the Fergana Valley, reducing the area of intensive farming;
- stopping the construction of new hydrotechnical structures, effective use of existing ones;
- carrying out repair works in the existing collectors and reservoirs in areas with strong salinity;
- such as placement of agricultural crops in accordance with landscape types.

Measures such as conversion of farms located in the hilly landscapes of the Fergana Valley into viticulture and horticultural farms, and expansion of the scope of low-demand crops will also have the expected effect.

In the hilly landscapes of the Fergana Valley, agrolandscapes make up a large part of the natural-anthropogenic systems. They can be different according to their structure and characteristics. The agrolandscapes of the hilly landscapes of the Fergana Valley can be divided into irrigated agriculture, dryland agriculture, pasture and grassland landscapes. Also, the territory of agrolandscapes is divided into agrourochishe and agrofacies, like natural landscapes. Agrolandscapes are characterized by low tolerance to natural-dynamic changes compared to natural landscapes [10,11]. Because in these landscapes, as a result of anthropogenic influence, a certain change has occurred in the life of living organisms, in the water and heat regime, in the process of soil formation, in the exchange of biogeochemical substances. destruction of pastures, etc.) leads to its emergence and development.

Irrigated agricultural landscapes are composed of meridional branching river basin directions in the regions. These irrigated agricultural areas are better developed in the lower regions of the Fergana Valley than in the upper parts of the hilly landscapes.

Non-irrigated agricultural landscapes are well developed in the upper parts of the hilly landscapes of the Ferghana Valley.

Pasture landscapes include the upper parts of the adyr landscapes of the Fergana Valley and the adyrs of the lower slopes.

Conclusion

It is natural that the location and development of agricultural industries in the adyrs of the Fergana Valley will continue in the future. Because, firstly, the adyrs are the main land fund of the region, and secondly, the number of the population of the region due to their growth, not only providing them with land, but also meeting the need for agricultural products is one of the important tasks. This means that the anthropogenic influence on the hilly region is increasing. As long as the adyrs of the Fergana Valley continue to be used for the development of society, it is necessary to rely on scientifically based action plans, along with careful treatment of adyr landscapes.

The change of the relief in the adyr landscapes of the Fergana Valley takes place in the following directions: quarry relief forms due to the excavation of land in the adyrs and the construction of roads; Constructions built for the purpose of irrigation and secondary forms of irrigation are melioration reliefs; terrace relief forms as a result of the establishment of gardens in the form of terraces on steep adyrsides; The emergence of flattened relief forms on adyrs intended for new irrigation affects the formation of landscape-ecological conditions

As a result of soil changes in the adyr landscapes of the Fergana Valley, landscape-ecological conditions have also changed. The directions of soil changes were manifested in the reduction of humus, conversion to cultural soil, salinization, erosion and other forms.

In the adyr landscapes of the Fergana Valley, agrolandscapes make up a large part of the natural-anthropogenic systems. They are divided into irrigated agriculture, dryland agriculture, pasture and grassland landscapes.

Irrigated agriculture is better developed in the lower adyrs than in the upper adyrs.

Non-irrigated agricultural farming is well developed in the upper parts of the adyrs.

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Rezyume: Aholisi eng zich joylashgan O'zbekiston respublikasining Farg'ona vodiysida qishloq xo'jaligining asosiy yer zahirasi hisoblangan adirlarida qishloq xo'jaligi va turli sanoat tarmoqlari hamda rekreatsiya tizimlarini rivojlantirish uchun qulay tabiiy geografik sharoit va landshaft komplekslarining mavjudligi tabiiy landshaft komplekslarini antropogen omillar ta'sirida bir qator o'zgarishlariga olib kelgan. Ular asosan antropogen rel'ef shakllarining hosil bo'lishi va rivojlanishi, tuproq qoplamining o'zgarishi hamda agrolandshaftlarning rivojlanishi ko'rinishlarida namoyon bo'lgan.

Резюме: В густонаселенной Ферганской долине Узбекистана адыры считаются основным земельным запасом для ведения сельского хозяйства. Наличие благоприятных природных условий, а также ландшафтных комплексов для развития рекреации системы ландшафтных комплексов привели к их изменению. Они в основном проявляются в возникновении и развитии антропогенных рельефных форм, изменении почвенного слоя, а также развитию агrolандшафтов.

Kalit so'zlar: adirlar, adir landshaftlari, antropogen rel'ef, rel'ef shakllari, tuproq qoplami o'zgarishi, agrolandshaftlar, agrolandshaftlarning rivojlanishi, tabiatdan samarali foydalanish, mezorel'ef, eroziya, tuproqlar, tabiiy-antropogen tizimlar.

Ключевые слова: адыры, адырные ландшафты, антропогенный рельеф, формы рельефа, изменение почвенного слоя, ландшафты, развитие агrolандшафтов, рациональное использование природы, мезорельеф, эрозия почвы, природно-антропогенные системы.

UZBEKISTAN'S STOCK MARKET ANALYSIS AND STOCK PRICE ESTIMATION IN THE MARKET

Abdurazakova N.

Karakalpak State University named after Berdakh

Summary: *This article investigates the current situation of the stock exchange in Uzbekistan, evaluates the impact of macroeconomic indicators on the activities of the stock exchange, and draws some conclusions and makes some recommendations as a result of its findings.*

Key words: *Stock, stock price, market price, stock exchange, Tobin's Q-ratio, Uzbekistan*

Introduction

Financial assets, such as stocks and bonds, have emerged as one of the most effective ways to generate and/or entice investment in recent years. The vast majority of investors are successful in turning a substantial profit from their stock and bond investments. However, there are some problems with determining the market value of the equities; sometimes they might be overpriced, and other times they can be undervalued. During the early years of Uzbekistan's independence, there were not many choices available to those who desired to make investments with their discretionary funds. Reforms are necessary in the financial markets in Uzbekistan, particularly the secondary financial market. People worry that they won't receive adequate information regarding stock prices, and as a result, they avoid investing in the types of assets that fall under this category. Even while stocks are seen as having a bigger potential for loss than other sorts of financial instruments, the returns that may be anticipated from this kind of asset are also higher.

When determining the value of stocks on the market in industrialized countries, there are a number of different methodologies and procedures available. There is not a reliable secondary stock market in Uzbekistan. This is primarily due to the high volume of non-liquid and low liquidity shares. As a result, the evaluation of the market value of stocks is sometimes carried out on a simplistic and unskilled level.

The imperfection of the system can be inferred from the flawed pricing technique. The theory of price formation and the methods of technical analysis are not working since the secondary market has not yet matured into a stable long-term market. However, methods of valuing the worth of stocks are employed for fundamental analysis because these approaches are more accurate. In Uzbekistan, there is a severe lack of confidence in the market value of the shares of joint stock enterprises due to the absence of a specific technique or strategy for determining the value of the stock on the market. The currently available method does not satisfy the requirements of the most up-to-date macroeconomic policy. This is seen as one of the challenges that must be overcome in order to successfully attract foreign investment in the nation.

The price at which a share of stock can be purchased and sold on the market at the present time is referred to as the share's market value. The market value of the company's own money, also known as the capitalization indicator, can be calculated by multiplying this price by the number of shares that have been placed in circulation.

Approaches to determine market value of stocks

The ownership of a stock, which belongs to its own unique category of securities, confers to its holder the ability to participate in the management of a joint-stock company and claim a portion of the issuer's profits.

There are two distinct routes one can take to profit from stock trading. The first approach is to make payments in the form of dividends, which are calculated as a percentage of the business's

overall profit. The second method is to trade shares on a stock exchange, both buying and selling them.

A stock's market price, or its worth on the market at a certain point in time, is an important aspect of a stock that investors should take into consideration. The capitalisation of the company can be calculated by multiplying the current price of a share by the total number of shares that have been issued (the market value of the equity of the issuing company). This price is able to be anticipated, and the appropriate transactions of buying and selling can be carried out in order to generate a profit.

There are three ways that the market value of shares can be determined in today's practice around the world. The decision to take a particular course of action as a result of the availability of the necessary knowledge.

Fundamentalist approach

The approach is based on the assumption of discounted future income. With a stable market, the following formula may be applicable for calculating the market price of shares:

$$Pa = \sum_{k=1}^{\infty} \frac{Ea}{(1+R)^k}$$

Where

Ea – potential income

k – number of years

R – required rate of return

In the case of a constant dividend size, the market price is defined as:

$$Pa = \frac{D}{R}$$

D – annual dividend amount

When dividends steadily increase, you should use the formula:

$$Pa = \frac{D_1(1+L)}{R-L}$$

D_1 – the last dividend amount

L – percent growth of dividends

Technocratic approach

Use of technical analysis for market price pricing the technocratic approach is based on the application and analysis of statistical data of stocks, with the help of which various trends are built in different time intervals. As a rule, such an option is used in Uzbekistan practice. Its disadvantage is the insufficiency of information required for the assessment (inefficient use of market mechanisms, insufficient liquidity of issuers).

Approach "at random"

This approach is characterized only by analysis of current indicators and denies dependence on past prices. This approach often cannot give an objective assessment.

Thus, the market price of shares is an objective indicator, due to both the prospects of the market and the expectations of its owners.

Reasons for a change in market price

As you know, the market price of shares is constantly changing. Moreover, the nature of these changes can be represented on the graph in the form of certain waves. Specialists identified several factors that have an important impact on the market price:

➤ competitive position in the financial market of the company whose shares are held by the investors;

➤ supply and demand for this type of securities;

- increasing the economic stability of the country where the issuing company is located;
- global course of economic policy;
- political tensions between states;
- the relationship of large financial corporations among themselves.

Methodology

In Uzbekistan the amount of investment that was attracted through stock market was very low. Compared to total investment in Uzbekistan i.e. investment through stock market to total investment was about 1 percent from 2010 to 2017. From 2014 to 2018, it increased slightly and accounted for 5.7 percent in 2010. However it decreased in 2011 and made up 4.5 percent of total investment in Uzbekistan. Investment through stock market did not make up even 6 percent of total investment in 2010 to 2020. It indicates that there is an actual issue that should be taken into consideration immediately. Share of investment through securities in GDP was 0.4 percent in 2015 and 2016. The highest indicator was 1.3 percent in 2018. But in 2020, it decreased and accounted for 1.1 percent of GDP. Obviously, these indicators show that attractiveness of stock market of Uzbekistan was not very high for investors.

Below we assess the impact of macroeconomic indicators to the stock market in Uzbekistan using the data from Statistics Committee of Uzbekistan.

Years	Investment growth X1	Monetarization coefficient X2	Refinancing rate X3	Mandatory reserve rate X4	Tax on profit X5	GDP X6	Trade volume in Stock market Y
2010	1,0	10,2	32,3	20	31	3,8	138,2
2011	3,7	10,2	26,8	20	26	4,2	152,9
2012	3,8	9,4	34,5	20	24	4,0	159,8
2013	4,5	9,3	27,1	20	20	4,4	180,5
2014	5,2	10,3	18,8	20	18	7,4	154,1
2015	7,0	14,2	16,0	15	15	7,0	123,8
2016	9,1	14,9	14,0	15	12	7,5	232,1
2017	22,9	17,3	14,0	13	10	9,0	117,8
2018	28,3	18,8	14,0	15	10	9,0	181,2
2019	47,7	20,0	14,0	14,0	10,0	8,1	106,0
2020	22,8	21,5	12,0	9,0	9,0	8,5	197,5

Figure 1 Macroeconomic (monetar and fiscal) policy, dynamics of Stock Market indicators

Source: Author's compilation.

Final conclusion

<i>Regression analysis</i>			
R-squared	0.7259		
Adjusted R-squared	0.3148		
Standard error	401.6727		
Observations	11		
	<i>Coefficients</i>	<i>Standard error</i>	<i>t-statistic</i>
Y-cross point	-401.7938	401.6727	-1.00
X 1 variable	-6.923485	2.399134	-2.89
X 2 variable	0.375751	16.46815	2.28
X 3 variable	1.297859	4.39806	0.30

X 4 variable	29.27025	14.18539	2.06
X 5 variable	-11.70916	5.006449	-2.34
X 6 variable	-28.03277	18.57205	-1.51

According to results R-squared is 0.726. It shows close connection among these economic indicators. The result show that increases in Tax, GDP and investments have a negative impact to trade volume in stock market. Among these indicators, 1 unit increase in mandatory reserve rate leads 29.270 unit increase in Trade volume in Stock market. Monetization coefficient does not have any influence on Trade volume in Stock market.

We will try to determine if the JSC's stocks are overvalued or undervalued using Tobin's Q ratio.

At the most basic level, the Tobin Q-ratio expresses the relationship between market valuation and intrinsic value. In other words, it is a means of assessing whether a given business or market is overvalued or undervalued.

$$Q \text{ ratio} = \frac{\text{Equity Market Value} + \text{Liabilities Market Value}}{\text{Equity Book Value} + \text{Liabilities Book Value}}$$

It is often assumed that the market value and the book value of a company's liabilities are equivalent. This reduces this version of Tobin's Q-ratio to the following:

$$Tobin's \text{ Q} - \text{ratio} = \frac{\text{Equity Market Value}}{\text{Equity Book Value}}$$

However there are some challenges to determine Q-ratio in Uzbekistan, because although we can get the Book value of Equity and Liabilities determining their market value is slightly difficult and requires much data to determine. Roughly taking this data may mislead investors and cause the result to be wrong. However calculating market value of equity and liabilities becomes easier, from our point of view using Tobin's Q-ratio will be a good method to find out fair value of stocks of JSC.

Conclusion

According to our analysis and research the following conclusions and proposals have been developed:

➤ After independence it took considerably long time to develop the activity of stock exchange in Uzbekistan. We even consider that it is still improving at lower speed than expected. Stock Exchange started performing better since 2014.

➤ The first IPO took place in 2018, and from our point of view this IPO had a positive contribution in the present progress of Uzbekistan;

➤ An increase in mandatory reserve rate leads higher increase in trade volume in stock market.

➤ Tobin's Q-ratio cannot be used to determine if stocks are undervalued or overvalued. Because there are some challenges to determine market value of equity and liabilities.

➤ The trade mechanism of stock exchange is not well developed. There is no information of β ratio of stocks in stock exchange, so investors may not determine their risk premium. From our point of view, if JSC give information about their securities β it will increase the trade volume in stock exchange.

➤ Theoretically there are many approaches to determine the market value of stocks, but because of lack of information about dividend policy of JSC, these approaches cannot be used to determine market value of stocks

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Rezyume: *Ushbu maqolada O'zbekiston fond birjasining bugungi holati o'rganilib, makroiqtisodiy ko'rsatkichlarning fond birjasi faoliyatiga ta'siri baholanadi va uning xulosalari bo'yicha ayrim xulosalar va tavsiyalar ishlab chiqiladi.*

Резюме: *В данной статье исследуется текущая ситуация на фондовой бирже Узбекистана, оценивается влияние макроэкономических показателей на деятельность фондовой биржи, а также делаются некоторые выводы и даются некоторые рекомендации по результатам ее выводов.*

Kalit so'zlar: *Qimmatli qog'ozlar, aksiyalar bahosi, bozor bahosi, birja, Tobinning Q nisbati, O'zbekiston*

Ключевые слова: *акции, цена акции, рыночная цена, фондовая биржа, коэффициент добротности Тобина, Узбекистан.*

ORGANIZATION OF INDEPENDENT WORK IN LINGUODIDACTICS

Bekmuratova U. A.

Karakalpak State University named after Berdakh

Summary: *The question disclosed by the author in this article is related to the problem of organizing independent work. The stages, levels of complexity of organizing independent work and their correct planning to achieve an effective result are considered, specific recommendations are offered for the implementation of the goals.*

Key words: *independent work, linguodidactics, methodological provisions of the organization of independent work.*

In modern Uzbekistan, the Russian language plays an important communicative and integrating role; it is the working language of international relations within the framework of relations with the CIS countries. The issue of foreign languages in the Republic of Uzbekistan (hereinafter RU), including Russian, is considered in the context of the development of world civilizations, new forms of communication, expansion of friendly ties, optimization of integration processes. The study of the Russian language, along with other languages, in RU is regarded as a social order of the present, determining the future of the country [5: 103].

According to the curriculum in RU, 36 hours are allocated for the study of the Russian language in universities. In the university program, in addition to the main time, there are additional hours for independent mastering of the language. Modern conditions of education require students to independently master the educational material - one can say that this is a global educational trend.

The organization of independent work of students in the process of teaching foreign languages using a variety of techniques / methods of its implementation allows you to get higher and more effective results in mastering the language, and this statement is already an axiom in modern linguodidactics.

According to V.V. Shalamov, the value of independent work depends on how exactly the students' activities are organized. The author writes: "The form of organization is a certain arrangement of the participants in the educational process, the ways of interaction between the teacher and the students, the students themselves." <> "But positive results are achieved if the teacher knows the capabilities of each form and the pedagogical conditions of use" [6].

Let us turn to various methodological ideas and concepts, the authors of which propose "forms" and "pedagogical conditions" (according to V. V. Shalamov) for organizing independent work.

It is difficult to disagree with V.A.Yakunin that students' independent work must meet the following requirements:

- "1) the student must clearly understand what the purpose of the study assignment is;
- 2) educational tasks are selected taking into account their complexity and availability;
- 3) methodological instructions in independent work should contain an algorithm for their implementation, be checked and corrected in a timely manner "[7].

For all the apparent obviousness of A. L. Kolzina's statement that when choosing the types of independent work (SR), establishing its volume and content, it is necessary to be guided by the basic principles of didactics and methodology [1], not all practicing teachers relate to the organization of independent work students according to these principles. It is no secret that as extracurricular (home) work, assignments can be given for which there was simply not enough time in class, and working with authentic texts (the same home reading) is not the choice of the students themselves and does not correspond to their needs.

According to A. L. Kolzina, the most important in organizing SR are the principles of accessibility and consistency, the connection between theory and practice, gradualness in the growth of difficulties, a differentiated approach, and creative activity. The author proposes to adhere to the following rules in planning CP:

1. SR should be focused and formulate a specific goal, this contributes to the successful implementation of the tasks.

2. The SR should be exactly the most powerful (our emphasis - U.B.), and in the course of work the tasks should be performed at an accelerated pace.

3. Offer such types of tasks for SWs that cannot be performed using ready-made samples or templates, ie. initiate the application of knowledge in completely new situations. Only in this case SW can really develop the skills of cognitive activity.

4. Each student must systematically replenish and deepen the general professional and special knowledge he already has [1: 124].

As you can see, the author, who proposes the above rules, rather harshly raises the question of the compulsory implementation of them by both the teacher and the student.

A different approach to independent work, taking into account the linguodidactic specifics of its organization, is suggested by T.G. Kuznetsova (S.A.

- the reproducing level of SR (reproduction or training): at this level, a base is created for the following levels, the pronunciation and lexical-grammatical basis of the studied language is being formed, language standards are laid in memory. In addition, at the same level, new teaching materials are acquired and consolidated;

- reconstructive (transitional or semi-creative) level of SR, which is a consequence of the formed previous level. At this level, the training material is mastered using the operations of analysis and synthesis. It is important that the acquired knowledge, skills and abilities were applied in different situations. It is clear that this level of SR requires a lot of mental work and creativity;

- creative (creative or search) CP level. This level requires independent work related to the formation of such skills and abilities as the search for solutions to more complex communication problems. At this level, the qualities of a creative personality and professional independence are developed.

That is why, in the process of teaching a foreign language, none of these levels should be ignored, and at different stages of learning they are involved either in stages or simultaneously [2: 18-19].

It seems to us that the teacher's knowledge of such a level system of independent work in linguodidactics would significantly help him in organizing effective independent work.

The well-known domestic teacher V. A. Kan-Kalik believes that "when planning independent work on a particular course, it is first of all necessary to single out its so-called fundamental tree, which includes that basic system of methodological, theoretical knowledge that needs to be taken out for compulsory lecture study "(for example, out of a 100-hour course, its volume will be half). "Further, as derivatives of this" fundamental tree ", it is proposed to form various types of independent work of students, providing them with topics, nature of study, forms, venue, variable ways of implementation, control and accounting system, as well as various reporting methods." The author is convinced that without such a system "not a single type of independent work of students will give an educational and professional effect" (cited in [4]).

The remark that, when planning independent work, it is absolutely correct to "take into account the individual characteristics of students. Tasks offered for self-fulfillment should have a clear goal, an unambiguously defined physician for its implementation and arouse the interest of students. The latter is achieved by the novelty of the content or form of the assignment, the disclosure of the practical significance of the issue under consideration, the research nature of the assignments "[3].

A group of methodologists-psychologists (O. Yu. Tarskaya, V. I. Valovik, E. V. Bushueva, N. I. Semikova and S. A. Sytnik) offers a fairly clear system of organizing independent work, which, in our opinion, can underlie the training of any professional activity. Let's consider its main provisions (see Table 1).

Table 1. The main methodological provisions of the organization of independent work (after O. Yu. Tarskaya, V. I. Valovik, E. V. Bushueva, N. I. Semikova and S. A. Sytnik [2007])

Interaction form	Organization stages	Methodological support
Business: the student receives instructions, recommendations, the teacher performs the function of management through accounting, control and correction of erroneous actions.	Stage I. Initial organization: the teacher is directly involved in the activities of the trainees (detection and indication of the causes of errors). Stage II. Self-organization: the participation of a teacher in the process of independent formation of students' knowledge is not required.	1. It is important to correctly determine the volume and structure of the content of educational material for SW. 2. Existing methodological materials are, as a rule, informational in nature. 3. Fundamentally new methodological developments are needed (inclusion of the student in the creative activity of mastering the discipline)

Note that practically each of the provisions presented in the table can act as a serious methodological problem that requires its solution. Let's pay attention to item 3 in the section "Methodological support", since the thesis about the need to create a new methodological support for independent work is considered one of the most relevant in modern linguodidactics.

In the study by V.V.Shalamov, dedicated to the organization of independent work, four levels of SR are named, one way or another called by different researchers:

- imitating or copying students' actions according to a given algorithm;
- reproductive activity (repetition of information about the various properties of the object under study), basically not going beyond memory;
- productive activity (independent application of the acquired knowledge to perform tasks that go beyond the known sample), requiring the ability to inductive and deductive methods;
- independent activity that develops hypothetical analog thinking by means of transferring knowledge when performing tasks in completely new situations, conditions for drawing up new decision-making programs.

Let's comment on the level-by-level independent work of the student (IWS) in the proposed sequence:

1. This level of CP allows the student to do what is required of him according to a given pattern in the assignment. Such work makes it possible to re-perceive educational information to obtain the necessary answers / decisions / conclusions. This can include working with textbooks, taking notes, reading, etc. The peculiarity of the SR at this stage is that the methods of performing tasks correspond to the instructions.

2. The essence of this stage is to solve the assigned tasks with the help of already assimilated knowledge, having the opportunity to update the long-learned information that will be required to perform various tasks, and it is necessary to do this as accurately and correctly as possible. This kind of CDS includes practical tasks, projects, tasks based on samples. A characteristic feature of this work is that you need to invest your ideas and methods in order to find answers / solutions / draw the necessary conclusions in relation to the proposed conditions.

3. At this stage of the CDS, when performing tasks, new experience is accumulated, while knowledge is transferred into skills and abilities. This includes the implementation of such complex

work as the preparation of essays, term papers and graduation projects. There is an active work on the search for information, the formulation and implementation of their ideas, which, of course, goes beyond the scope of experience and requires students to change their work, approach it from a different position.

4. This stage is very important because it creates conditions for creative activity. This independent work requires students to deeply penetrate into the studied object and, at the same time, form new connections and relationships in order to find new positions, ideas for generating new information. This type of SR most often refers to research work.

So, for the successful organization of independent work of students, you need:

- 1) "an integrated approach to organizing such activities for all forms of classroom work;
- 2) a combination of all levels of independent work;
- 3) ensuring control over the quality of performance (requirements, consultations);
- 4) forms of control "[4].

Note that independent work is necessary and important at all stages of the learning process, from actualization to the application of the knowledge gained. It is necessary to understand that the teacher's help should gradually fade away, otherwise the student's activity in performing SR will decrease.

Other serious problems that directly affect the success / failure of the organization of independent work, we would include:

- a) the degree of preparedness of the student for educational and cognitive activities. We mean not only motivation to study in general and the desire to master a specific discipline, but also the habit of mental work, or at least an understanding of the need for such a habit;
- b) the ability to work with information, starting with its search, then analysis, synthesis and evaluation, i.e. the ability to think critically, or at least the desire to develop such thinking;
- c) the desire to master modern educational technologies, i.e. to learn to "learn" without engaging in reproduction of the knowledge offered by the teacher, but to try to independently "obtain" it;
- d) insufficient methodological equipment of the process of organizing and conducting SR;
- e) the lack of a systematic approach to the organization of SR due to insufficient qualifications of the teacher.

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Rezyume: Ushbu maqolada muallif mustaqil ishlarni tashkil etish bilan bog'liq masalaga to'xtalib o'tadi. Mustaqil ishlarni tashkil etishning murakkablik bosqichlari va samarali natijaga

erishish uchun ularni to'g'ri rejalashtirish bosqichlari ko'rib chiqiladi, shuningdek, belgilangan maqsadlarni amalga oshirish bo'yicha aniq tavsiyalar taklif etiladi.

Резюме: В данной статье автор затрагивает вопрос, связанный с организацией самостоятельной работы. Рассмотрены этапы сложности организации самостоятельной работы и их правильного планирования для достижения эффективного результата, а также предложены конкретные рекомендации по реализации поставленных целей.

Kalit so'zlar: mustaqil ish, lingvodidaktika, mustaqil ishni tashkil etishning uslubiy qoidalari.

Ключевые слова: самостоятельная работа, лингводидактика, методические положения организации самостоятельной работы.

**ANALYSIS OF THE CURRENT STATE OF THE LEVEL OF THE HIDDEN ECONOMY
IN THE REPUBLIC OF UZBEKISTAN**

Elmurodov Sh.

Tashkent Kimyo International University

Summary: *This article examines the current state of the underground economy in the Republic of Uzbekistan. The method of calculating the hidden economy is shown.*

Key words :*tax, hidden economy, public finance, financial mechanism*

Introduction

The level of the underground economy in Uzbekistan is not reflected in any international ratings. This is not because there is no hidden economy in our country, but because for many years the authorities responsible for it in our country preferred not to participate in international ratings. However, denying the problem does not mean that it will go away by itself.

In general, the wide participation of Uzbekistan in international ratings is a product of the state policy implemented in the next five years. As part of this policy, in 2018-2019, for the first time, research was conducted on the impact of the underground economy on the economy of Uzbekistan. Analyzes have shown that the level of the hidden economy is around 40-50 percent of GDP.

In September 2019, the current Ministry of Economic Development and Poverty Alleviation held a roundtable discussion on the topic "The hidden economy in Uzbekistan: assessment of the situation, reasons and ways to reduce it" and the open discussion of the problem in it attracted the attention of many international experts and revealed many previously unmentioned problems of Uzbekistan today. was now an important signal to indicate that label for open discussion. the important point is that the President's Address to the Oliy Majlis openly raised this problem, which showed that there is no way to hesitate or retreat in approaches to this issue.

Literature review

Since financial inclusion ensures the participation of a large sector of the economy in the formal financial system, it creates a positive externality in the economy, as it enables more effective implementation of monetary policy. In fact, high financial inclusion allows interest rates to become an effective policy tool, as Mehrotra, A., and Yetman, J. According to his research, Central Banks facilitate a mechanism through which they can stabilize price levels. As inclusiveness allows for a smoothing of higher consumption, households are able to adjust to changes in interest rates by adjusting the level of savings and loans. Higher financial inclusion can encourage households to convert their savings into deposits. Khan HR. and Tombini, A. concluded that high levels of financial inclusion make interest rates a relatively powerful and key policy tool. As financial inclusion increases, monetary reserves begin to convert from currency in circulation to interest-bearing deposits in the banking system. This allows most economic activity to be controlled by interest rates. Khan HR. the larger the informal sector, the more difficult it is to implement and control monetary policy, as the decisions of more households and small business owners are independent of central banks' monetary policy. In addition, financial inclusion encourages people to move from a cash economy to a banking economy, so their financial transactions can be tracked.

Mehrotra, A. and Yetman, J. clarifies that when more agents are included in the formal financial system, output volatility increases relative to inflation volatility because financial agents are better able to change their investment and savings decisions. Therefore, as financial inclusion increases, central banks will be able to focus on stabilizing prices and thereby increasing financial stability. In some countries, central banks focus on the core price index to determine inflation targets, but the choice of this price index can sometimes be wrong. Mbutor, MO, & Uba, IA

analyzed the effect of the level of financial inclusion on the effectiveness of monetary policy in Nigeria from 1980 to 2012. Their results support the claim that higher levels of financial inclusion play an important role. However, when the variable of number of bank branches was included, this result did not hold, actually showing a negative relationship. This shows that the purpose of banks in opening new branches is mainly to seek more profit, but not to increase financial opportunities.

Analysis and results

If we refer to the rating of the International Monetary Fund, which evaluates the share of the hidden economy in the GDP of countries, a situation similar to Uzbekistan can be seen in Ukraine and some CIS member countries, as well as in countries such as Gambia, Belize, Congo, and Honduras. As mentioned above, there are a number of ways to determine the level of the hidden economy, using which we will try to determine the level of the hidden economy in Uzbekistan.

There is Gutman's method of determining the level of the hidden economy based on the relationship between cash and deposits, and within the framework of this study, the size of the hidden economy was determined using the modified method of the ratio of cash deposits in 1997-2018. The calculation of the volume of the hidden economy for each year under consideration was carried out using the standard formula of the modified cash ratio. The base year was 1997, when the level of hidden economic activity was zero. The size of the hidden economy in the period when the calculation of this model starts is considered equal to 0, and its growth rate is observed. Average annual volume of cash in circulation (C) in 1997-2018 to estimate the shadow economy using the modified cash deposit ratio method,

(Y) size statistics were used. In this study, the modified cash-to-deposit ratio method calculations use inflation- and population-adjusted cash flow fundamentals.

In particular, depending on the level of inflation, the GDP deflator is used. In general, the adjusted base amount of cash in circulation (C₀) for each year is calculated as follows:

- By dividing the actual amount of cash in the base year of 1997 by the population (at the end of the year), the base amount of cash per capita is calculated;

- the adjusted base amount of cash in the economy in 1998 is calculated by applying the deflator of GDP in 1998 to the base amount of cash per capita and multiplying the amount received by the population in 1998;

- The adjusted base amount of cash in the economy in 1999 is calculated by applying the cumulative value of the GDP deflator for 1998-1999. The calculation of the adjusted base volumes of cash funds in the economy in 2000-2018 is carried out in a similar way.

It should be noted that the actual volume of required deposits (Dt) and the amount of cash in circulation (Ct) do not need to be changed, since they already take into account the effects of inflation and population changes. Calculations made using the standard formula of the ratio of modified cash to demand deposits showed that in the last 10 years (2009-2018), the volume of the underground economy in Uzbekistan was 39.7% of the average GDP.

At the same time, in general, there was a gradual increase in the size of the underground economy from 33.7 percent of GDP in 2009 to 40.7 percent of GDP in 2015 and 48 percent in 2018.

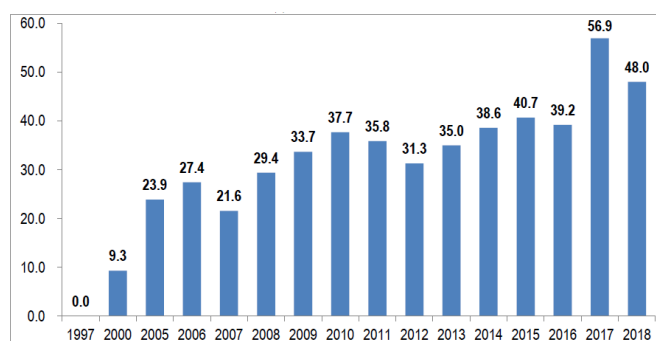


Figure 1. A measure of the level of the shadow economy based on the relationship between cash and deposits

As can be seen from the data in the above picture, the size of the underground economy in the Republic of Uzbekistan has had a growing trend over the years. According to the Ministry of Economic Development and Poverty Alleviation, in 2020, the level of the underground economy was equal to 50% of the GDP.

The significant increase in the volume of the hidden economy in 2017, shown by the results of the calculations of this study, is associated with a significant increase in the volume of cash in circulation, and the supply of cash to the economy increased from 4.8% to 5.9% of GDP, and their share in the money supply was the same as in 2016. From 24.9 percent to 28.2 percent in 2017, the share of cash in the M1 money supply increased from 47 percent to 58.3 percent.

A decrease in the volume of the hidden economy to 48% of GDP in 2018 compared to 56.9% in 2017, as well as a corresponding change in the indicators of cash circulation in the economy, i.e. cash supply from 5.9% to 5.1% of GDP, as well as the share of money in the money supply in 2017 from 28.2% in 2018 to 26.6% in 2018. It should also be noted that since 2017, the significant increase in the amount of cash in circulation was reflected in the decrease of the share of payments made using bank cards in the total volume of retail goods turnover from 60.3 percent in 2016 to 50.1 percent in 2017. This decrease can be interpreted as a confirmation of the increase in the share of cash payments in the economy of Uzbekistan in 2017-2018 compared to previous periods.

At the same time, it should be remembered that the monetary policy indicators, based on simple ratios of cash funds and required deposits, are highly sensitive to changes.

On the other hand, it should also be taken into account that in the short term there may be a scenario of a significant decrease in the efficiency of the tax administration, as well as a certain part of the increased amount of cash.

Thus, based on the results of the modified cash deposit ratio method, it can be concluded that the average volume of the underground economy in Uzbekistan is 40% of GDP.

Another factor affecting the level of the hidden economy is the amount of value added tax. Value-added tax incentives cause disproportion of opportunities for enterprises operating in the same sector. In addition, the VAT rate set in Uzbekistan is quite low compared to neighboring countries. In particular, in Kazakhstan and Kyrgyzstan it will be 12%, while in Tajikistan, a differentiated rate will be applied: 0%, 5% and 18%. Kazakhstan and Kyrgyzstan have the advantage in this regard, and Uzbek producers lose their opportunity in this regard. For this reason, we also determine the impact of the VAT deductions on the level of the hidden economy below, for which we conduct a correlation analysis between these two indicators.

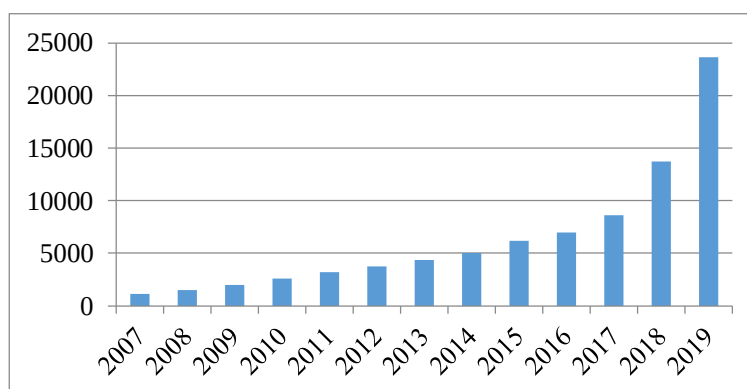


Figure 2. Dynamics of value added tax revenue (billion soums)

As can be seen from the above figure, the amount of income from VAT to the state budget tends to increase over the years. The reduction of this tax rate from 20% to 15% had a significant impact on the amount of tax revenues. In this part of our monograph, we will perform an

econometric analysis, is the level of the hidden economy decreasing or increasing along with the increase in VAT revenues? We can determine this without performing regression analysis. In order to see the relationship between these indicators, we determine the correlation coefficient between them.

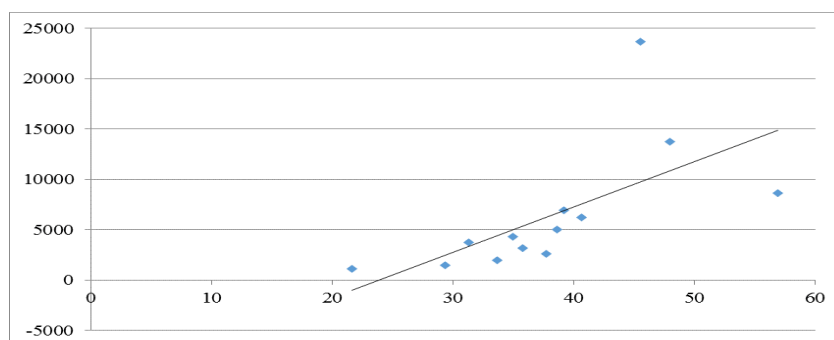


Figure 3. The relationship between VAT revenue and the level of the hidden economy

The relationship between these indicators, that is, their correlation coefficient is equal to 0.8. This means that there is a positive correlation between them, that is, despite the increase in VAT revenues, the level of the hidden economy is also increasing.

Deficiencies in the VAT calculation and collection mechanism may also cause most of the transactions to be carried out in the underground sector. It is recommended to implement the tax policy to stimulate the demand for goods and services in the direction of encouraging formal entrepreneurship through VAT discounts in areas where underground economic activity is widespread. This policy has been successfully implemented, for example, in France and Italy, and is based on the hypothesis that a low tax burden increases the culture of paying taxes for taxpayers, as entrepreneurs increase their turnover by increasing demand. The main advantage of such a policy is that it encourages fundamental changes in the behavior of taxpayers. so that tax officials should estimate the price elasticity of demand for goods and services in the industry. If as a result of such a decrease in VAT, the demand for goods and services does not increase or increases insignificantly, then this policy does not justify itself. For this purpose, the tax authorities should determine to what extent the price change will affect the demand through the tax rate.

Conclusion

In the Republic of Uzbekistan, there is a positive correlation between income from value added tax and the level of the underground economy.

The level of the shadow economy is also affected by information asymmetry, where businesses can avoid taxes or pay less tax by understating or hiding their income, which may make them unable to obtain bank loans, which in turn affects their expansion.

Entrepreneurs operating in the shadow economy hide their income and structure their financial accounts primarily to avoid tax burdens and social security contributions.

The index of trade openness has a negative effect on the level of the hidden economy, an increase in the index of trade openness serves to reduce the level of the hidden economy.

Tax revenues have a negative effect on the level of the shadow economy, so when tax revenues increase, the level of the shadow economy decreases. A high tax burden encourages businesses to operate in the shadow economy, because if the after-tax income is not sufficient to run the business effectively, they will move to the informal sector due to the burden.

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Rezyume: Ushbu maqolada O'zbekiston Respublikasida yashirin iqtisodiyot darajasi joriy holati o'rganilgan. Yashirin iqtisodiyotni hisoblash usuli ko'rsatilgan.

Резюме: Аннотация. В данной статье рассматривается современное состояние теневой экономики в Республике Узбекистан. Показан метод расчета скрытой экономики.

Kalit so'zlar: soliq, yashirin iqtisodiyot, davlat moliyasi, moliyaviy mexanizm

Ключевые слова: налог, скрытая экономика, государственные финансы, финансовый механизм.

PECULIARITIES OF OUTSOURCING SERVICES EFFECTIVENESS ASSESSMENT

Atadzhanov K., Babadzhanov U.

Urgench State University

Summary: *This article describes the features of effectiveness evaluation of outsourcing services. Existing national and foreign approaches to the organization of the outsourcing services are studied and analyzed. It is established that the existing approaches carry fragment character and they do not provide the enterprise with the ability to substantially evaluate the necessity and the effectiveness of the outsourcing applying. The method for outsourcing involvement efficiency is developed through comparing the relevant expenses of the enterprise, taking into consideration the structure of the conditionally changeable expenses. It is discovered that the current method provides the enterprise with the possibility to take a decision as to the possibility of outsourcing involvement, or execution of the functions independently. Practical recommendations for the enterprises as to the application of the outsourcing or the insourcing depending on the dominating conditionally constant or conditionally changeable expenses in the structure are developed. The approach to the evaluation of the outsourcing efficiency in accordance with the indicators system is established, which foresees the application of the developed key efficiency indicators system with finding of the integral value to take the decision about the efficiency of involvement of the outsourcing services is provided.*

Key words: *outsourcing, goodwill, outsourcing efficiency, capital market methodology, transactions methodology, industry coefficients methodology.*

Introduction

As everybody is aware of the proverb: “If you want something done properly, do it yourself”. However, today this folk wisdom cannot be considered fully relevant. In today's business world, many companies are focused on their specific activities, while outsourcing other less significant functions.

Outsourcing (from English outsourcing: (outer-source-using) the use of an external source and/or resource) is the transfer of certain types or functions of industrial entrepreneurial activity by an organization on the basis of a contract to another company operating in the required area. [1]

Enterprise outsourcing allows you to use all the necessary services in a specific time period, established by a bilateral contract, saving the organization's budget. If it sounds unclear in words, you can look at the following example: a small company selling tea and coffee needs the services of a carrier 3 times a week. If you take the driver on the staff, you need to provide him not only a full-time wage (and this at the part-time work week), but also quality transport, repair and maintenance which also falls on the shoulders of the enterprise. The costs in this case will be 5-6 times higher than the profitability, so it is economically unprofitable to hire a person on a permanent basis.

What does outsourcing offer in this case? The company will be offered specialists who will perform tasks on an ad hoc basis or as many as necessary for a reasonable fee. This will not only save the budget, but also relieve the management from dealing with force majeure situations related to equipment malfunctions or the illness of an employee.

Accordingly, the key goal of outsourcing is to free the enterprise from a number of tasks with the opportunity to save budget, time and human resources. The ultimate goal of any business is to make a profit. It is easy to guess that it is not profitable for small businesses to hire couriers or accountants, if all these services can be ordered from special outsourcing agencies, which guarantee quality, fast and reliable work. According to the most conservative statistics, outsourcing helps save up to 18% of total profits, which is relatively a lot, especially for large organizations. [2]

The key feature of outsourcing, which distinguishes it from other forms of service provision, is the conclusion of a bilateral contract in which the rights and obligations of the two parties are spelled out. This contract is concluded for a long period, but can be terminated if one of the parties fails to fulfill its obligations, which is enshrined in the provisions. In practice, such long-term cooperation has a number of advantages for the two parties and is considered mutually beneficial.

Main part

The basis of the proposed method for calculating the effectiveness of outsourcing is the ratio of the two absolute indices characterizing the benefits achieved through outsourcing and the costs incurred in the process of implementing the functions with the outsourcers. Let us consider the components of this calculation in more detail.

Benefits associated with the introduction of outsourcing can be identified through the index, on the increase of which the realization of each outsourcing-decision is aimed eventually. The additional effect achieved through the introduction of the methodology of design of company business processes based on outsourcing, comprehensive implementation of outsourcing solutions, is expressed in the excess of the company income over the income usual for the industry.

The successful implementation of outsourcing projects can lead, as already noted, to the achievement by the company of a number of advantages. As a result of the concentration of efforts on the main directions of activity and attraction of specialized companies to perform a part of the functions, a more effective management system is formed, both basic and non-key tasks are performed more qualitatively. Positive result is achieved due to the professional performance of each business process, as well as the ability to use the latest technology in the work. In the strategic perspective the methodology of designing the business processes of the company on the basis of outsourcing is aimed at gaining a strong position in the market, which in particular is expressed in the creation of a positive image of the company, expanding the circle of consumers, maintenance of long-term business relations with the contractors.

The basis for calculating the effectiveness of outsourcing should be an indicator, the value of which depends directly on the chosen method of implementing the business processes of the company, in particular the decision on the transfer of certain functions to outsourcers. This indicator having an intangible basis is able, due to its inexhaustibility, to bring the firm income that significantly exceeds the standard profit on the assets of the organization. The result of successfully implemented outsourcing solutions is reflected in the value of the indicator, often defined as the difference between the market value of the company as a whole and the value of its net assets on the balance sheet. This indicator is the goodwill of the organization, in foreign practice referred to as goodwill.

Currently in the literature can be found the following definitions of the concept of goodwill:

- a general well-established opinion about the qualities, strengths and weaknesses of the organization in the sphere of business turnover, which determines the attitude of the external environment to it, and can bring supernormal profit; [3, 26]

- benefits associated with the introduction of outsourcing can be identified through the index, on the increase of which the realization of each outsourcing-decision is aimed eventually. [4]

With regard to the term goodwill (goodwill), used as a foreign analogue of the term goodwill, the following definitions can also be found:

- The goodwill of an organization, a type of intangible assets, intangible fixed capital. In the balance sheet represents the amount actually paid in excess of the book value of assets to another enterprise during the purchase or merger in recognition of the "intangible" advantages of this organization, such as convenient location, prestige, good reputation with customers, experience, strong market position, etc., that is, the book value of the organization's name. [5, 113]

- The totality of those elements of the business that encourage customers to continue to use the services of the business and generate profits beyond what is required to generate a reasonable

return on all other assets of the business, including income on all other intangible assets that can be identified and separately valued; [3, 74]

- goodwill acquired in a business combination, which consists of payments of the acquirer as potential economic benefits acquired by the organization in the future, which are difficult to graduate and separately recognize in the accounts at the stage of the purchase; [6, 43]

- a concept that characterizes the price of a company's high reputation, an effective management system, the innovative nature of the technology used, the dominant position in the product market and a number of other characteristics, up to and including its favorable geographical location; [7]

- business reputation, good name and positive image of the company. Goodwill usually consists of: notional value of business connections, reputation and intangible value of business, which is based on good relations with clients, high morale of the company's employees, etc. The main components of goodwill are: good faith in the implementation of business activities, reliability, loyalty of the enterprise to partners, information openness, as well as business activity of the enterprise; [3, 89]

- a set of intangible factors (the company's brand name, its reputation on the market, technological and managerial culture, established relationships with counterparties, etc.) that allow the company to have certain competitive advantages in business.[8]

The official definition of the concept of goodwill is presented in the Regulations on Accounting (hereinafter RAS) of the Republic of Uzbekistan. According to RAS № 14/2007 "Accounting of Intangible Assets" goodwill is the difference between the purchase price of the organization (as an acquired property complex as a whole) and the cost on the balance sheet of all its assets and liabilities. At the same time positive goodwill is considered as a premium to the price paid by the buyer in expectation of future economic benefits, and negative goodwill - as a discount from the price given to the buyer due to the lack of factors of stable buyers, quality reputation, marketing and sales skills, business connections, management experience, level of personnel qualification.

In the work of C.B. Gorin "Business reputation of the organization" the author, in the process of determining the components of the concept of business reputation, gives the following classification of intangible assets of the firm:

Group 1. Assets inseparable from the enterprise: trained personnel, customers, the company's image, the advantages of territorial location, achievements in advertising, as well as overcoming the difficulties of the initial phase of activity.

Group 2. Assets inseparable from the individual, to which the author includes the reputation of managers and owners in the business world and relationships in the team.

Group 3. Assets inseparable from the enterprise are identifiable intangible assets (rights to trademarks, patents for inventions, know-how in technology).

As C.B. Gorin, goodwill forms the assets of the first and second groups, if the assets of the third group are evaluated specifically. In general, goodwill may include assets of all three groups, since, as a rule, only part of identifiable intangible assets is taken into account.

In the work "Business reputation of an organization" the author also presented a hierarchy of organizational needs, created by analogy with A. Maslow's hierarchy of human needs. Business reputation C.B. Gorin places it on one of the highest levels of the needs of the firm. As the primary needs, without the satisfaction of which the normal functioning of the company is impossible, the following are distinguished: the need for resources (information, material, labor, financial, etc.); the need for economic security (prevention of bankruptcy that is, efficiency, solvency, legality); the need for profit. To the needs of a higher order the author refers the need for a positive business reputation and social mission. They can be satisfied only after the satisfaction of primary needs. "The social mission as a need that makes sense to satisfy is relevant only in a socially oriented

economy with developed civil and legal institutions, when the organization "dissolves" in the society and lives its needs, which to some extent is ideal. Positive business reputation in the hierarchy of C.B. Gorin is an established positive general opinion about the organization as a subject of business relations, bringing it super-profits. Business reputation of the organization, being an intangible asset with minimal liquidity, is able to bring significant revenues. The author notes the importance for an organization to focus on a kind of investment in intangible assets, which often give greater returns than tangible ones. With regard to goodwill, this idea is particularly relevant, since additional benefits are achieved at the expense of an asset that is not accounted for on an organization's balance sheet. In accordance with domestic accounting standards, goodwill created within the organization is not recognized as an asset, and can be accounted for only in the case of the sale of the firm, merger or acquisition. However, in practice, the need to assess goodwill arises not only in the sale of the company. For example, the assessment of goodwill is required when determining the amount of damage due to the publication of materials that discredit the business reputation of a company or, as in this case, when conducting operations of a management nature that contribute to a change in the value of the company.

In assessing the value of goodwill, we can use the method recorded in current regulatory documentation, based on the comparison of the purchase price of the company with the book value of its net assets. To calculate the market value of the company we use a comparative approach based on comparing the business in question with the value of comparable companies.

There are the following methods to evaluate the value of enterprises within the framework of comparative approach: capital market approach, transaction methodology, industry coefficients methodology.

Capital market approach is based on the market price of the shares of enterprises, which are similar to the evaluated enterprise. An investor, acting according to the principle of substitution, may invest his funds either in a similar enterprise or in the enterprise being evaluated. On this basis, the data on the value of shares of comparable similar enterprises can serve as reference points for determining the value of the shares of the enterprise being evaluated. "The advantage of this method is the use of actual information available at stock market, but not forecast data (characterized by the known uncertainty), as in case of application of income approach methods.

The method of industry coefficients or industry ratios is used for approximate estimation of the enterprise value. At that, the correlation between the price of the business and some financial index is used. The method is based on the statistics of previous transactions with business property in specific industries. Basovsky L.E. notes: the experience of appraisers in developed market economies shows that industry ratios can be quite stable: accounting firms and advertising agencies are usually sold for 50-70% of annual sales, respectively; restaurants and travel agencies for 25-50% and 4-10% of annual sales, respectively; gas stations for 1.2-2.0 monthly sales; retailers for 75-150% of "net income + equipment + inventory"; machine-building companies for 1.5-2.5 amounts of "net income + inventory". Approximately the value of large businesses in developed countries is estimated as the volume of sales for 10-12 months, that is, the ratio of annual sales to value is 100-120%.

The method of transactions, or the method of comparative analysis of sales, is based on the analysis of purchase prices of controlling interests in comparable enterprises, or the enterprise as a whole. This method analyzes the information not from the stock market, but from the market of mergers and acquisitions. The advantage of such methodology is the reflection of the real business practice. The main difference between the transaction method and the capital market method is that the transaction method defines the level of value of the controlling interest, which allows to fully manage the enterprise, while the capital market method defines the value of the enterprise on the level of the non-controlling interest.

In the process of applying the comparative approach to the valuation of the company the main attention should be paid to the justification of the choice of companies-analogues. A.B. Gukova as the main factors that should be considered when justifying the choice of companies-analogues, distinguishes:

- 1) belonging to the same industry;
- 2) similarity of quantitative and qualitative characteristics of the assessed business and enterprises-analogues (including: diversification of companies' activity; comparability of products; comparability of markets in which the enterprises operate; size of enterprises; consideration of historical trends (dynamics of costs, profitability of enterprises); ability of enterprises to pay dividends; other characteristics)
- 3) the amount of information on enterprises and the possibility of its verification;
- 4) conditions of transactions by enterprises-analogues (market or not).

It should be noted that this list of comparability criteria is not an exhaustive list of comparability criteria.

The value of the company indicates its production and financial capabilities; therefore, the correlation between the price and the most important financial indicators should be the same for comparable enterprises. The comparative enterprise value assessment supposes calculation of price multipliers - coefficients showing the correlation between market price of enterprise and the most important financial parameters, such as profit, cash flow, dividend payments, sales revenue, assets value. Many multipliers can be used in the calculation process, but there will be as many value options. Specialist-evaluator, guided by the specific purpose of assessment, the degree of confidence in the various information determines the weight of each multiplier in the assessment. After mathematical weighting, the value will be obtained, which is the basis for the final adjustments. The final value is adjusted according to the specific circumstances, in particular, the value of non-functioning and surplus assets that can be sold on the market is added. Surplus and deficit working capital is added and subtracted, respectively.

The advantage of the comparative approach is that its methods are based on market data, and therefore reflect the real supply and demand for a particular business. The disadvantages of this approach include the lack of consideration of the future development of the enterprise, as well as the difficulty in obtaining all necessary information. It is quite difficult to obtain additional information on the enterprises of analogues, because it can represent a trade secret. S.V. Gorin also notes that the difficulties in applying this method in Russia arise because of the undeveloped and uninformative stock market. Thus, the possibility of using the comparison approach to assess the value of the company is determined by the availability of data on the actual transactions.

After the identification of the indicator, reflecting the benefits received from the outsourcing introduction in the company activity, it is necessary to define the content of the cost part of the calculation of the efficiency of the company business processes organization.

By correlating the advantages gained as a result of outsourcing implementation with the amount of costs for the tasks implementation through outsourcing, we get the coefficient characterizing the success of the chosen scheme of the company business processes implementation. This coefficient, designated by us as the efficiency of the company business processes organization, is calculated by the following formula:

$$E = OBR/C, (1)$$

Where, E – is the efficiency of organization of the company's business processes; OBR is the organization's business reputation; C is the cost of the company's business processes.

In the process of evaluating the success of the outsourcing solutions adopted it is necessary to study the change of this coefficient over time. For this purpose it is necessary to calculate the coefficient value for the period in which outsourcing was not applied as well as for the similar period in which business processes were performed using outsourcers. The results of the analysis

can be presented both in the form of absolute change of the efficiency value and in the form of growth rate and growth rate of the coefficient under study (formulas 2, 3, 4).

$$AC = E_{or} - E_o, (2)$$

Where, AC is the absolute change in the efficiency coefficient of the company's business processes organization; E_{or} is the efficiency of organization of the company's business processes using own resources; E_o is the efficiency of organization of business processes using outsourcing.

$$GR_e = E_o / E_{or} * 100 \%, (3)$$

where GR_e is the growth rate of the efficiency of the company's business processes.

$$GR_{eo} = E_{ss} / E_{ss} * 100 \%, (4)$$

where GR_{eo} is the growth rate of efficiency of business processes organization.

It is also advisable to analyze the reasons for changes in the business reputation index in the period of outsourcing application as compared to the previous period. To do this it is necessary to calculate the absolute change of business reputation in the period of outsourcing application as compared to the period when the functions were performed by own forces (formula 5).

$$BRI = BRI_a - BRI_f, (5)$$

where BRI_a is the value of the indicator business reputation for the period of application of outsourcing; BRI_f is the value of the indicator business reputation for the period of implementation of the functions by own forces.

Further, based on the proposed calculation of the effectiveness of the organization of the company's business processes, it is possible to build the following model of dependence of the business reputation indicator on the cost factors of the company's business processes and the effectiveness of the organization of the company's business processes (formula 6):

$$OBR = 3 \times E (6)$$

After the interrelation of the business reputation indicator with the factors of business process costs and the efficiency of the organization of the company's business processes, using the methods of factor analysis (chain substitutions, arithmetic differences), it is possible to identify the impact of each factor in the model on the change of business reputation in the period of application of outsourcing in comparison with the period of the independent implementation of the company's business processes. The results of the calculations should show at the expense of what to a greater extent there was a change in business reputation (at the expense of the increase in the funds spent on the implementation of business processes, or at the expense of the increase in the efficiency of the organization of the company's activities). The calculation is made on the basis of the received factor model with the use of elimination method (conditional elimination of the influence of all factors in the model, except for one, the effect of which is currently analyzed). The algorithm for calculating the influence of factors on changes in the size of business reputation is presented in Table 1.

Table 1

Algorithm of calculating the effect of factors on changes in the value of the goodwill indicator1

Indicator	Chain substitution method	Arithmetic difference method
Total change in the value of goodwill	$BRI_a - BRI_f = (Co * E_{oe}) - (Co * E_{oe})$	
including, due to changes in the cost factor of the company's business processes	$(Co * E_{oe}) - (Co_e * E_{oe})$	$(Co - Co_e) * E_{oe}$
due to changes in the efficiency factor of the organization of the company's business processes	$(Co * E_o) - (Co * E_{oe})$	$(E_o - E_{oe}) * Co$

o - value of the indicator for the period of outsourcing

oe - value of the indicator for the period of exercising functions by own efforts

Conclusion

Thus, in the process of studying the effectiveness of the organization of the company's business processes, it is advisable to perform the following procedures:

1. To calculate the efficiency of organization of the company's business processes for the period preceding the period of outsourcing implementation in the company's activities.

2. To calculate the efficiency for the similar period of outsourcing application.

3. Identify the absolute (relative) change in efficiency by comparing its value for the period in which outsourcing was used with the value of this indicator for the preceding period.

4. Identify the absolute change in the business reputation indicator before and after outsourcing was applied.

5. Based on the methods of factor analysis to study the impact of changes in each of the factors (costs and efficiency of the organization of business processes) on the change of the analyzed indicator (business reputation of the company).

6. Interpret the results and make appropriate management decisions.

Thus, the conclusions on the effectiveness of outsourcing should be made taking into account the different levels of the project evaluation, starting from comparison of the contract requirements with the actual results of the provider's work and ending with the evaluation of the impact of the new model of organization of activities on the achievement of strategic advantages by the company. In this case the success of outsourcing application is largely determined by the clear implementation of each stage of outsourcing implementation (formation of the outsourcing order, selection of the outsourcer, conclusion of the outsourcing agreement, contract management), which requires the development and approval of principles and approaches of the company to the outsourcing implementation on the basis of studying the essence of the new method of business organization and the established practice of outsourcing application.

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Rezyume: *Ushbu maqolada autsorsing xizmatlari samaradorligini baholash xususiyatlari tasvirlangan. Autsorsing xizmatlarini tashkil etishda mavjud milliy va xorijiy yondashuvlar o'rganilgan va tahlil qilingan. Mavjud yondashuvlar korxonaga autsorsingni qo'llash zarurati va samaradorligini jiddiy baholash imkoniyatini bermasligi aniqlandi. Autsorsingni jalb qilish samaradorligini oshirish usuli shartli o'zgaruvchan xarajatlar tarkibini hisobga olgan holda korxonaning tegishli xarajatlarini taqqoslash orqali ishlab chiqiladi. Ma'lum bo'lishicha, joriy usul korxonaga autsorsingni jalb qilish yoki funktsiyalarni mustaqil ravishda bajarish imkoniyati to'g'risida qaror qabul qilish imkoniyatini beradi. Korxonalar uchun tuzilmada hukmron bo'lgan shartli doimiy yoki shartli o'zgaruvchan xarajatlarga qarab autsorsing yoki insorsingni qo'llash bo'yicha amaliy tavsiyalar ishlab chiqilgan. Indikatorlar tizimiga muvofiq autsorsing samaradorligini baholashga yondashuv o'rnatildi, bu autsorsing xizmatlarini jalb qilish*

samaradorligi to'g'risida qaror qabul qilish uchun integral qiymatni topib, ishlab chiqilgan asosiy samaradorlik ko'rsatkichlari tizimini qo'llashni nazarda tutadi.

Резюме: В данной статье описаны особенности оценки эффективности аутсорсинговых услуг. Изучены и проанализированы существующие отечественные и зарубежные подходы к организации аутсорсинговых услуг. Установлено, что существующие подходы носят фрагментарный характер и не дают предприятию возможности существенно оценить необходимость и эффективность применения аутсорсинга. Разработан метод оценки эффективности привлечения аутсорсинга путем сравнения соответствующих расходов предприятия с учетом структуры условно-постоянных расходов. Выявлено, что данный метод дает возможность предприятию принять решение о возможности привлечения аутсорсера или самостоятельного выполнения функций. Разработаны практические рекомендации для предприятий по применению аутсорсинга или инсорсинга в зависимости от преобладания в структуре условно-постоянных или условно-изменчивых затрат. Установлен подход к оценке эффективности аутсорсинга в соответствии с системой показателей, предусматривающий применение разработанной системы ключевых показателей эффективности с нахождением интегрального значения для принятия решения об эффективности привлечения аутсорсинговых услуг.

Kalit so'zlar: autsorsing, gudvil, autsorsing samaradorligi, kapital bozori metodologiyasi, bitimlar metodologiyasi, tarmoq koeffitsientlari metodologiyasi.

Ключевые слова: аутсорсинг, гудвилл, эффективность аутсорсинга, методология рынка капитала, методология сделок, методология отраслевых коэффициентов.

PRACTICAL USE OF INNOVATIVE METHODS AND TECHNIQUES FOR ENHANCING STUDENTS' CRITICAL THINKING SKILLS

Kalabaeva M.

Karakalpak state University named after Berdakh

Summary: *This article deals with the experience the teacher shares to help enhance critical, analytical skills of students of higher educational establishments. Due to technological advancements educating our young generation is becoming a hot issue since we, teachers have a great abundance of responsibilities to produce highly qualified and competent personnel to meet demands of the world market.*

Key words: *critical, analytical, case-study, enhance, skills, activities.*

Due to technological advancements educating our young generation is becoming a hot issue since we, teachers have a great abundance of responsibilities to produce highly qualified and competent personnel to meet demands of the world market. In order to implement the Decrees of our President, we make a lot of efforts to develop students' competence which include mastering foreign languages, critical thinking and analytical thinking skills, teambuilding and communication skills as well.

I promote effective speaking in their classrooms by engaging students in communicative activities to develop oral proficiency. The activities aim to develop students' confidence in using English in various communication situations, both formal and informal. The ability to speak English effortlessly in a variety of situations requires good pronunciation, a wide range of vocabulary, grammatical accuracy and also the knowledge of what to say to whom and when. In short, proficiency in speaking includes knowledge not only of the language but also social and cultural norms, and the ability to respond appropriately in a variety of situations. This technique contains a range of activities for the teacher to use in the classrooms to encourage students to speak effectively and with confidence.

The activities are mainly designed around shared experiences, to be done in pairs and groups so that students learn to respond spontaneously in any communication situation. In this article I present a critical thinking method including such techniques as a case-study, Thin and Thick questions, Discussion.

The case study method is a learning system that is based on analysis, decision and discussing simulated or real situations.

The immediate goal of the case study method is through the joint efforts of a group of students to analyze the situation that arises in a particular state of affairs, and develop a practical solution; the end of the process is the evaluation of the proposed algorithms rhythms and choosing the best in the context of the problem.

The essence of the case study method is independent foreign language activity students in an artificially created professional environment, which makes it possible the ability to combine theoretical training and practical skills necessary for creative activity in the professional sphere. Students are invited to comprehend four situations of professional activity that provide for the necessary solution to the problem. The Case study method allows you to take into account the professional preparation of students, their interests, developed style of thinking and behavior, which allows it to be widely used for teaching a foreign language.

Case-study

I play a video "The last leaf", students watch video and pay attention to new vocabulary including idiomatic expressions and discuss them after watching it.

Then I ask several questions for checking comprehension. In doing this, I used a critical thinking activity

I. Thin and thick questions:

Thin questions	Thick questions
Who are the main characters of the story?	What would you do if you were in Sue' position?
Where did the girls live?	How do you overcome difficulties in your life?
What masterpiece did their neighbor create?	Do you think people should sacrifice their lives for friends ' sake ?
What happened to Sue at the end of the story?	What do you think other ways out of that situation would be?

II. Case- study. Identify problems and find solutions to each of them:

problems	solutions
Girls live in poverty	Apply for employment agency

In the activity students do a case –study in small groups, they discuss and write on a poster which they present to the group , take turns to speak about accomplished work.

III. Discussion . After making presentation students discuss all the problems and potential solutions to them together and sort out the best ideas to tackle the problems happened in the movie.

IV. For consolidation of the new topic ,I encourage them to act out the scene of the movie and facilitate them by assigning the roles of main characters Sue, Johnsy , Behrman and a doctor.

These activities help them generate ideas, and to organise them logically and present them in a convincing manner. The students are very highly motivated. Moreover , they enhance critical thinking and analytical skills, learn to work in a team and enhance interpersonal skills.

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Rezyume: Maqolada o'qituvchining oliy ta'lim talabalarining tanqidiy, tahliliy qobiliyatlarini yaxshilashga yordam beradigan tajribasi haqida so'z boradi. Texnologik taraqqiyot tufayli yosh avlodimizga ta'lim-tarbiya berish dolzarb masalaga aylanib bormoqda, chunki jahon bozori talablariga javob beradigan yuqori malakali va malakali kadrlar tayyorlashda biz o'qituvchilarning zimmasiga ulkan mas'uliyat yuklangan.

Резюме: В статье речь идет об опыте, которым делится преподаватель, чтобы помочь повысить критические, аналитические способности студентов высших учебных заведений. Благодаря технологическим достижениям обучение нашего молодого поколения становится актуальной проблемой, поскольку на нас, учителей, возлагается огромное количество обязанностей по подготовке высококвалифицированных и компетентных кадров, отвечающих требованиям мирового рынка.

Kalit so'zlar: tanqidiy, tahliliy, amaliy tadqiqotlar, malaka oshirish, faoliyat.

Ключевые слова: критический, аналитический, кейс-стади, повышение квалификации, деятельность.

UDC 551.40(575.1)

**THE ROLE OF GEOTECHNICAL SYSTEMS IN THE TRANSFORMATION OF THE
ADYRS OF THE FERGANA VALLEY**

Mirzamakhmudov O. T.
Namangan State University

Summary: *In this article, the development of geotechnical systems in the adyrs of the Fergana Valley and the transformational processes that have arisen as a result of it are thoroughly studied, and the adyrs of the Fergana Valley are landscape-ecologically regionalized.*

Key words: *adyr landscapes, geotechnical system, development of geotechnical systems, classification of geotechnical systems, landscape changes, natural-technogenic systems, anthropogenic landscapes, changed landscapes.*

Introduction.

It is important to study the transformation of adyr landscapes, to separate, demarcate, and classify their morphological units, as well as map them for various sectors of the national economy, and to develop ways of their effective use. In the Strategy of Actions for the further development of the Republic of Uzbekistan during 2017-2021, important tasks were identified for "further improvement of the reclamation state of irrigated lands, development of land reclamation sectors and irrigation facilities" [1]. In this regard, in order to improve the productivity of irrigated areas in the hilly landscapes of the Fergana Valley, to improve land reclamation and water supply, to implement large-scale irrigation and land reclamation measures within the framework of state programs in order to comply with agrotechnical rules, research the transformation of hills, their zoning, determine the geo ecological condition and optimize them, targeted research on mapping for various purposes is important.

The formation and development of geotechnical systems is directly related to the development of science and technology and the rapid increase of the population, as well as the desire to use natural resources as much as possible and the development of the economy. Since the middle of the last century, many geotechnical systems have been created and developed as a result of the interaction of technology with nature and taking the form of an integrated natural-technical system. [11]. One side of this issue, this was a great impetus for meeting the needs of the population and the development of the economy. On the other hand, the creation and development of geotechnical systems causes a certain change of the natural environment and landscapes in those areas. In turn, this requires the study of development processes of geotechnical systems and their consequences.

To date, the theoretical foundations of geotechnical systems have been studied by several scientists. In this regard, A.E. Fersman, G.F. Khilmi, V.S. Preobrazhensky, I.P. Gerasimov, L.F. Kunitsyn, V.I. Bulatov, A.Yu. Reteyum, K.N. Dyakonov, I.Yu. Dolgushin, F.N. Milkov and others views are commendable. In their works, they mainly tried to define the concept of geotechnical systems, to classify geotechnical systems as much as possible, to study their general aspects, and in some cases to reveal the characteristics of geotextiles in a certain area [4,5,9,13,14,]. However, the development processes of geotechnical systems in all regions and their consequences have not been sufficiently studied. Also, as the population continues to grow and science and technology continue to develop, in turn, it requires continuous study of the development processes of geotechnical systems and their consequences.

The methodological basis of the research work is the following, i.e. the factors affecting the transformation of the adyrs of the Fergana Valley are identified and analyzed. The factors influencing the change of adyrs are evaluated and the area is zoned.

Analysis and results

Most of the territory of the Fergana Valley consists of adyr landscapes, and the natural conditions of these areas provide favorable opportunities for the development of agriculture. As a result, the main part of these regions specialized in irrigated agriculture, on the basis of which many irrigated lands, canals, collectors, reservoirs, and other geotechnical systems were created and developed. As a result, the territory lost its natural character and was replaced by a number of anthropogenic systems. Including Andijan Reservoir, Karkidon Reservoir, Chortoq Reservoir, Eskier Reservoir, Kenkolsoy Reservoir, Almasoy Reservoir, Sarvoksoy Reservoir, Big Andijan Canal, Big Fergana Canal, Big Namangan Canal, Northern Fergana Canal, Southern Fergana Canal and others. In addition, most of the large cities of the valley, various factories and plants, transport and railways are located in the adyrs which have favorable natural conditions.

In turn, the formation and development of such geotechnical systems, shows its positive and negative effects. For example, among the canals, the Southern Fergana canal is 162 km long and supplies water to 75.8 thousand ha, the Big Andijan canal is 109 km long, and the total irrigation area is 140.6 thousand ha, the Big Namangan canal is 135.3 km long and 47 provides water to 1,000 ha of land, the Big Fergana canal is 270 km long in the territory of Uzbekistan and supplies water to an area of 203,600 ha.

From reservoirs, the full water volume of Kosonsay reservoir is 165.0 million. m³, 32,000 hectares of new cultivated land in Kosonsay-Chust-Torakurgan districts, full water volume of Chartaksay reservoir is 23 million. m³, a total of 3207 hectares of cultivated land, full water volume of Eskier reservoir is 20.0 million. m³, covering a total of 2464 hectares of cultivated land, the full water volume of the Karasuv reservoir is 7.0 million. m³, covering 1250 hectares of cultivated land, the full water volume of the Varzik reservoir is 18.0 million. m³, which allows to supply 2428 hectares of cultivated land with water [10].

As a result of this, high productivity in agriculture has been achieved in the Fergana Valley and serves as an important factor in meeting the needs of a large number of people.

There are a number of opinions regarding the processes of development of the geotechnical systems of the hills of the Fergana Valley and their consequences.

N.I.Akhlyrtseva distinguishes five types of anthropogenic landscapes based on the characteristics of the direction of the anthropogenic process of all landscapes.

1. Altered landscapes. 2. Renatured landscapes. 3. Transformed anthropogenic landscapes. 4. Natural landscapes. 5. Anthropogenic landscapes [2].

A.G.Isochenko classified the impact of human activity on landscapes and its theoretical problems mainly reflects four groups of landscapes:

1) conditionally unmodified (primitive) landscapes. 2) weakly modified landscapes. 3) disturbed (strongly modified) landscapes. 4) cultural landscapes [7].

D. L.Armand divides landscapes changed under the influence of human activity into five types:

1. Almost completely changed landscapes. 2. Strongly modified landscapes. 3. Slightly modified landscapes. 4. Weakly modified landscapes. 5. Almost unchanged landscapes [2].

V.L.Kotelnikov divides landscapes into modified, weakly modified, moderately modified, strongly modified and planned types [10].

According to I.M.Zabelin, anthropogenic landscapes are further divided into two: natural anthropogenic and cultural landscapes [10].

According to A.G. Isachenko, most of the modern landscapes have been changed as a result of unreasonable human activity, and it is necessary to turn them into cultural landscapes. One of the main characteristics of such landscapes should be responsibility and economic efficiency [6,7].

The main goal of man is to develop the internal potential of landscapes, to activate natural processes and to increase the efficiency of landscapes. For example, when he engages in farming, he sets his sights on one thing first, that is, to get as much agricultural produce as possible. To achieve this goal, he flattens the landscape, turns the soil to a certain thickness, applies fertilizers, plants a certain crop, irrigates, uses various drugs against weeds and pests, washes the salt of the soil, drains the sewage, etc. In this case, it causes various environmental problems.

Conclusion

The adyrs of the Fergana Valley have undergone a number of changes under the influence of various branches of human economic activity, especially agriculture. They consist of the change of the relief, the reduction of the amount of humus in the soil, the creation of agricultural-irrigation deposits, the washing of the soil layer, the pollution of landscapes, the development of engineering geographical processes, etc. [11].

During the formation of geographical conditions in the hills of the Fergana Valley, relief changes occur in the following directions: quarry relief forms due to land excavation and road construction; constructions built for the purpose of irrigation and secondary forms of irrigation are melioration reliefs; unique relief forms as a result of the establishment of gardens and vineyards in the form of terraces on sloping hillsides; flattened landforms have appeared in the areas targeted for new irrigation.

The directions of soil change were manifested in the reduction of humus, conversion to cultural soil, salinization, erosion and other forms.

A large part of the natural-anthropogenic systems in the region is made up of agricultural-landscapes. They consist of irrigated agriculture, dryland agriculture, pasture and grassland.

It is natural that the location and development of agricultural industries in the adyrs of the Fergana Valley will continue in the future. Because, firstly, the adyrs are the main land fund of the region, and secondly, due to the growing number of the population of the region, it is one of the important tasks to provide them not only with land plots, but also to satisfy the need for agricultural products. This means that the anthropogenic impact on the hill region is increasing [12]. As long as the hills of the Fergana Valley continue to be used for the development of society, it is necessary to pay attention to the following, along with careful treatment of adyr landscapes:

1. For this, it is necessary to properly understand the features between the geological structure and paleo geographical conditions of the place or region and the development of agricultural-landscapes. (If there is a layer of water-permeable rocks (gravel, sand, sandstone, etc.) in the beds below the soil, groundwater may not rise during irrigation. If an impermeable layer is located above, groundwater may rise during irrigation and cause salinization and swamping processes.

2. The paleogeographic conditions of the place can have a positive and negative effect on the development of agricultural-landscapes. (If salt layers or deposits with a high content of salt were formed in ancient geological periods, when the underground water rises, these salts can rise and lead to salinization of land resources. The development of ravines, landslides, erosion also lead to the failure of land resources).

3. Artificial factors include land leveling, drying, plowing, irrigation works and structures. In the process of development of land resources, depressions are filled, heights are lowered, as a result of which the natural topography of the place changes. During the drying up of land resources, their water and air conditions change dramatically. If the drying process is carried out incorrectly, the moisture of the soil will decrease and it will dry out, causing the development of wind and water

erosion. If mistakes are made during irrigation, soil salinization, waterlogging and erosion processes develop.

4. As a result of excessive use of mineral fertilizers, the amount of salts in agricultural-landscapes increases dramatically. If a lot of phosphorus fertilizers are applied, a lot of fluorine accumulates in agricultural-landscapes, if a lot of nitrogen fertilizers are applied, a lot of nitric acid salts are accumulated.

5. As the weight of agricultural machinery increases, the density of the soil increases. The amount of weight that falls on the soil is 1 kg/cm², if the weight is 3-5 kg/cm², the productivity decreases by 30-35% [3,15]. These processes have a great influence on the development and morphological structure of agrarian landscapes. Natural factors play an important role in the stratification of land resources or agricultural-landscapes and their classification.

Taking into account the changes that have occurred in the geosystems of the adyrs of the Fergana Valley due to human influence, O.T. Mirzamakhmudov divided the following regions into it: weakly changed, changed, moderately changed, strongly changed, extremely strongly changed landscape-ecological regions [10]. (Figure 1).

In particular, the geographical conditions of the landscape-ecological region, which have been slightly changed, are mainly caused by pasture livestock, climate, inland waters, and terrain.

The geographical conditions of the changed landscape-ecological region are created by the economic activities of people, internal waters, relief.

The geographical conditions of the moderately changed landscape-ecological region are created by relief, climate and economic activities of people.

Highly changed landscape-ecological conditions are caused by anthropogenic influence and inland waters, mainly pasture livestock, as well as climate and relief.

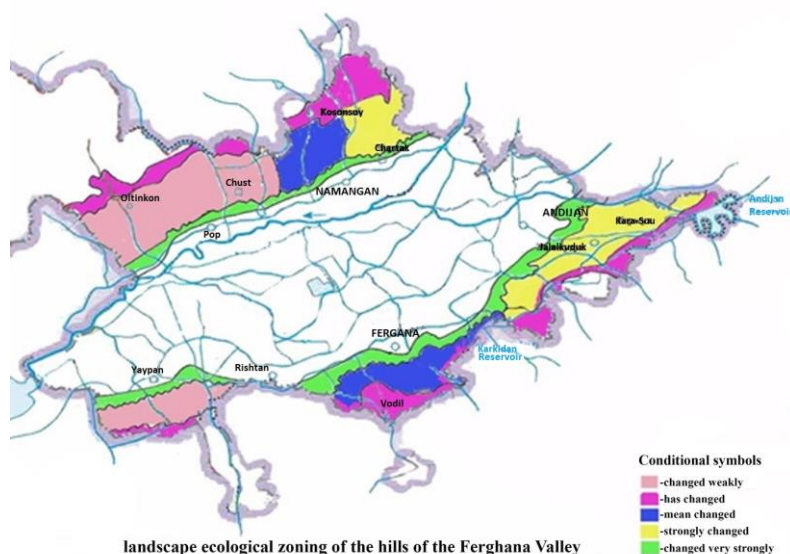


Figure 1.

In the formation of the strongly changed landscape-ecological region conditions the main role of human economic activities, climate, inland waters, relief has been fully substantiated.

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Rezyume: *Farg'ona vodiysi adirlarida geotextizimlarning rivojlanishi va uning natijasida vujudga kelgan transformatsion jarayonlar atroflicha o'rganilib, Farg'ona vodiysi adirlari landshaft-ekologik jihatdan rayonlashtirilgan.*

Резюме: *В данной статье сделан подробный анализ развития геотехнических систем адыров Ферганской долины и вытекающих из этих трансформационные процессы ландшафтно-экологического районирования.*

Kalit so'zlar: *Adir landshaftlari, geotextizim, geotextizimlarning rivojlanishi, geotextizimlarni tasniflash, landshaftlarning o'zgarganligi, tabiiy-texnogen tizmlar, antropogen landshaftlar, o'zgargan landshaftlar.*

Ключевые слова: *ландшафты адыров, геотехническая система, развитие геотехнических систем, классификация геотехнических систем, изменения ландшафтов, природно-техногенные системы, антропогенные ландшафты, измененные ландшафты.*

DIGITILAZATION OF MANAGEMENT SYSTEM OF HOUSING AND COMMUNAL SPHERE IN UZBEKISTAN

Khasanov T. A.

Academy of Public Administration under the President of the Republic of Uzbekistan

Summary: *In this article, the author studied the relevance of the information and communication technologies in housing and communal sphere in the world, its positive value, convenience and advantages of a new type of digital services for the population. He also analyzed the existing problems of digitalization and substantiated the importance of their solution for the development of the housing and communal sphere in Uzbekistan.*

Key words: *housing and communal sphere, information and communication technologies, digital management, digital services, strategic planning, transparency, competition.*

Introduction. Housing and communal sphere is a technical complex of buildings, structures, engineering networks and equipment, as well as industrial, repair and construction production and maintenance. The result of the functioning of the housing and communal sphere is ensuring the safety and effective use of the housing stock, uninterrupted provision of housing and communal services necessary for human life, further increase in the level of improvement and sanitary condition of the territories of municipalities, and general comfort of living.

The development of market relations in housing and communal sphere is determined by the processes of sustainable development of business structures that are in the phase of active institutionalization. By institutionalization, we mean a complex multi-aspect process with a certain number of stages that ensure the formation of a wide range of entrepreneurship forms that fulfill their inherent target settings, ensuring the satisfaction of the population's demand for housing and communal services within a managed socio-economic system. All this contributes to the integrated development of the territory.

Main part. Today, the implementation of information and communication technologies in the housing and communal sphere of all countries has become a very topical issue. Naturally, this has economic benefits: they include improving the quality of urban management, the performance of industrial enterprises and reducing costs. At the same time, it means providing easy and fast services for citizens.

The general trend towards digitalization affects all sectors of the economy to a greater or lesser extent, so the housing and utilities sector is no exception. Information technology can ensure high security, uninterrupted operation of all city services, and most importantly, IT solutions can help reduce costs.

In general, it's not about the demand for information technology, but about the digitization of housing and communal sphere as part of strategic planning. In this regard, the digitization of housing and communal sphere, the use of previously non-existent innovative technologies to improve work efficiency, the quality of decisions made, including the previously implemented automation, is a trend to increase efficiency.

Scientific works on improving the housing and communal sphere management system have been carried out by many foreign scholars, like Ostrom E. [1], Nahrath S. [2], Baudoui R. [3], Talbot D. [4], Paris D., Seys F.-O. [5].

For some aspects of the functioning and the possibilities of organizing effective management system among researchers of the CIS countries, scientific researches have been carried out by such scientists as Larionova A. [6], Kirsanov S. [7], Lomova M. [8], Stepaev K. [9], Krygina A., Krygina N. [10].

Scientists and economists of our country have studied some aspects of the housing and communal sphere management system, as of Khasanov T. [11], Nurimbetov R., Sultanov A. [12], Toshmatov Sh. [13], Davletov I. [14], Yodgarov V., Butunov D. [15].

These works mainly studied the impact of housing management on the socio-economic status of the population and on the level of urbanization of the country. However, the effectiveness and advanced methods of housing management have not been identified, which, in turn, served as the basis for determining the direction of this research work.

Results. Digitization of housing and communal sphere has several important functions. There are [6],

- ✚ First of all, increase the efficiency of management processes - reduce losses, reduce indirect and excessive costs in tariffs, etc.;

- ✚ Second, reducing the amount of receivables in the industry and consequently reducing the additional financial burden on the business;

- ✚ Third, to ensure the transparency of the industry for public oversight and regulation;

- ✚ Fourth, to improve the quality of housing and communal sphere provided by creating elements of market competition in the industry and, consequently, reducing tariffs.

In general, the creation of conditions for attracting private investment in the development of this sector, as well as in the field of housing and communal sphere - on the state of housing, promotions, the volume and quality of services provided and energy consumption, consumers of housing and communal services allows you to create a complete, reliable and relevant database.

To this day, many measures have been taken to improve the quality and efficiency of organizations in the field of housing and communal sphere. Also, many types of digital user services in sub-industry segments are created by management companies, computing centers, many of which are key market participants that are actively developing their IT platforms and services, i.e. customer software and so on.

However, the main problems currently facing in this area are the lack, low quality and dissemination of data in the field of housing and communal sphere, including the lack of clear definition and sources of references [12].

On a global scale, it's possible to create an integrated architecture of the digital system of housing and communal sphere on the basis of digital platforms. Specially applied technologies are used to automate various functions, i.e. forecasting and modeling, accounting for spent resources, accepting payments and fees for services, document flow, and more.

In general, there are a wide range of technological opportunities in the field of housing and communal sphere. For example, it can automatically receive "smart metering devices" connected to monitoring systems through data transmission channels and transfer utility bills and fees to acceptable information systems based on the data it receives. Process automation allows you to automate the process of receiving payments using digital software - through a mobile application or online cash register.

Artificial intelligence technologies are being introduced to increase the efficiency of monitoring and management of infrastructure facilities. Artificial intelligence enables the transition to a flexible supply of utility resources, i.e., automates the delivery of their supply depending on various variables, taking into account user scenarios.

Another technology is the creation of "digital twins" of communal infrastructure facilities, which are "trained" on historical data and connected to smart sensors installed in the facilities themselves. The new digital system will allow to quickly identify accidents and emergencies, to determine which infrastructure facilities require repair. This makes it easier to account for and forecast the repair and replacement of heat supply networks, and to plan investment and production programs.

At the same time, companies implementing the requirements of the “Smart City” standard in the field of housing and communal sphere at the regional and municipal levels, including certification and control of the life cycle of housing, resource consumption and monitoring of infrastructure, housing management companies automation and management of activities, centralization of dispatching functions, automation of capital repair management, centralization of payment calculation and customer service functions [13].

Public authorities are interested in increasing efficiency through the introduction of digital technologies, as increasing the transparency and reliability of data in the field of housing and communal sphere, the ability to obtain structured data on various bases helps to make management decisions at all levels.

Digitization of housing and communal sphere of the housing and communal companies means the simplification of management reporting and the reduction of mandatory reporting by automating a number of processes. In addition, the emergence of digital technologies - electronic forms of appeals, online voting - simplifies the interaction of citizens and homeowners' associations, increases the level of public participation in improving the quality of housing and communal sphere [11].

For professional management companies, the use of digital technology is a competitive advantage. There is now a tendency to consolidate the multi-family home management market. Small management companies are leaving the market, and the growing share is occupied by large companies operating under one brand in several regions. They are not only engaged in the collection and transaction of utility bills, but also offer a wide range of additional services to the population. Digital management companies increase operational efficiency and profitability and optimize processes by expanding management and technology solutions.

As a result of the introduction of modern information and communication technologies, the market of housing and communal sphere is gradually becoming more transparent and understandable to the population. Transparency helps to increase trust in the state through convenient interactive interfaces.

Digital platforms allow citizens to be involved in evaluation and management procedures. Digitization of housing and communal sphere, for example, involves the introduction of the possibility of holding general meetings of building owners in multi-storey houses by electronic voting, rather than in person.

Conclusions. In conclusion, the rapidly implementation of best practices poses some challenges. Examples include the lack of technological standards, the lack of development of regional and city IT systems for housing and communal sphere, the frequent changes in the regulatory framework in the field, the lack of regulatory mechanisms in the field of digitalization.

The financing is also relevant for this industry, for example, there are no mechanisms to attract investment in the field of digitization of housing and communal sphere, including from market participants.

Solving these problems will further increase the ability to effectively manage a set of different systems in the field, creating conditions for the systematic collection, aggregation and analysis of data. The development of information systems in the field of housing and communal sphere necessitates the systematization of life cycle processes, the creation of tools for data aggregation, the coordination of projects around a single legal space.

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Rezyume: Maqolada bugungi kunda dunyo mamlakatlari uy-joy kommunal xo'jaligida axborot kommunikatsiya texnologiyalarini joriy etishning dolzarbligi, uning ijobiy ahamiyati, yaratiladigan yangi turdagi raqamli xizmatlarning aholi uchun qulayligi va afzalligi yoritilgan. Shuningdek, O'zbekistonda uy-joy kommunal xo'jaligi sohasini raqamlashtirishdagi mavjud muammolar tahlil qilingan va ular yechimining sohani rivojlantirishdagi ahamiyati asoslantirilgan.

Резюме: В данной статье автором изучена актуальность информационно-коммуникационных технологий в жилищно-коммунальной сфере в мире, ее положительное значение, удобство и преимущества нового вида цифровых услуг для населения. Он также проанализировал существующие проблемы цифровизации и обосновал важность их решения для развития жилищно-коммунальной сферы Узбекистана.

Kalit so'zlar: uy-joy kommunal xo'jaligi, axborot kommunikatsiya texnologiyalari, raqamli boshqaruv, raqamli xizmatlar, strategik rejalashtirish, shaffoflik, raqobat.

Ключевые слова: жилищно-коммунальная сфера, информационно-коммуникационные технологии, цифровое управление, цифровые услуги, стратегическое планирование, прозрачность, конкуренция.

UDK: 903.2 (903.01/ 903.21)

COUNTRY OF BAKIRGAN

Alimbetov A.K., Tolybaev M.E.

Karakalpak State University named after Berdakh

Summary: *The article talks about the fact that Sulayman Bakirgani's worldview is close in meaning and substance to Yassavi's Hikmat, that they complement each other logically, and that their works are loved and popular among the people. Also, in the legend and commentary on Hakim father, information is given that he was born and buried at the confluence of the Amudarya - at the foot of the Aral Sea, in a place called Bakirgan. This information is based on factual information from well-known scientists and appropriate conclusions are drawn.*

Key words: *Turkic peoples, cult, mysticism, maps, studies, conclusions, Khovand, Madmina, Aral Sea, Ustyurt, Kungrad, Khojayli, "Hakim Ata" mausoleum, caravan routes.*

Ahmad Yassavi's reliable and devoted student, worthy follower of Yassaviya sect in poetry and sect is Sulayman Bakirgani. Bakirgani is known by the nickname Hakim father among the Turkic peoples. Boqirgani's works, which teach religion and mysticism, love and morality, are loved and popular among the people.

Boqirgani's worldview is so close to Yassavi's "Wisdom" both in terms of meaning and essence that they logically complement each other in many cases.

From a scientific point of view, M.F.Koprilizada said, "Father Hakim Suleiman had the right to achieve the most important position among Yassavi's followers from the point of view of establishing this tradition for the first time. He was right when he said that his works have been alive among the people for eight hundred years, just like the works of the Sheikh [9, 5].

In the historical-geographical works and maps of the 18th-19th centuries, we can find information about the peoples and cities of the Aral Sea region. The Southern Archipelago is marked on the map of A. Maas (1735). The Ustirt plain and Kungirost area of the Aral Sea were mapped for the first time in 1826. 1832 Caravan routes from Orenburg to Khiva, locations of defense structures are mapped.

In 1841 Khanykov, 1842 special ambassador of the Russian Empire G. Danilevsky "writes that near Kungrad there is a tomb of the saintly grandfather of Karakalpaks, the great Hakim father." Butakov, the admiral of the Aral Sea, who was on call twice (1849), mapped the mausoleum of "Hakim Ota" on a topographic map. During Yakovlev's 1858 and Ignatev's military expeditions in 1859, the Hakim Ota mausoleum was marked on the map.

In 1858-1859, Russian officer, lieutenant Mozhaisky, surveyor Zelenin, topographer Chernyshev took part in mapping the location of the "Holy cemetery Hakim ata" complex.

In 1863 Mullah Ysraq of Kungrad left Kungrad with Hungarian Turkic scholar German Vamberi and visited the "Hakim Ata" mausoleum.

In the information of the Central Military History Archive in Moscow, in the Asian section of the General Staff (1836-1879), it is written that the "Hakim Ota" mausoleum is located in the cities of Xojayli, Kungrad, and in the north of the harbor of the caravan routes. In addition, A.Kun wrote in the archive that the caravan route passed through that place as "Tomb of Hakim Ata".

In 1892, Pashkevich, who conducted a technical-geological survey of the caravan routes through Ustyurt to Kungrad, Nikitin stated: 11 km from Kungrad. it is noted that "Bughrokhan Minaret" is located in the distance. Also, "Tower Burakhan" is shown on the map of the work of the General Staff of the Russian Empire, Colonel A. V. Kaulbars, "In the Amudarya pond" [10, 61-62].

The famous Russian orientalist K. G. Zaleman wrote in the legend about father Hakim, in the review of legends, that he was born and buried in the place called Bakirgan at the confluence of Amudarya - at the foot of the Aral Sea. In the Turkish Muslim world, Sulayman Bakirgani is recognized as a saint after Khoja Ahmed Yassavi. That's why the people built magnificent mausoleums on top of his grave several times. For example, it was restored in the 12 th, 14 th, 16 th centuries, and the last one in the 19 th century by the Khan of Khiva Ollokhuli (1826-1843) [1, 144].

After the last built mausoleum fell under the water due to the river flood of 1935-1946, in 1978, under the leadership of Dawletali Jabbarov, the local people built a place and a dome made of baked clay over the graves of Hakim father and Sayyid father.

In 2019, under the leadership of the President of the Republic of Uzbekistan Sh.M. Mirziyoyev, the generous mausoleum of Hakim father Suleiman Bagyrgani was restored [8, 8].

Maktimkuli Khwaja Ahmed Yassavi was equated with Hazrat Ali and worshiped as "Ahmed Yassavi, owner of the climate" [7, 14].

Wrestlers before fighting, knights before riding, riders on horseback: "O Hazrat Hakim father! Do it yourself!" worshiped as [6, 4].

Also, the famous Russian scientist Academician A.N.Samoylovich, who is well versed in the history of the Turkic peoples (1903), wrote in his article "Two fragments from Khorazmnoma": "The slogan of the Uzbeks of Khiva is ``O, Hazrat Palvan!" "O, Shakhimardan", the slogan of the Karakalpaks is "O, Hazrat Hakim Ata" - he wrote [4, 83].

Academician V.V.Bartold (1868-1930), who deeply researched ancient sources written in Arabic, Persian and Turkish languages, confirms the opinions of K. G. Zaleman and in his articles "Hakim ata" and "About the question of the place where Hakim ata was born" writes as follows:

"Father Hakim is a Turkic-speaking saint from Khorezm. A student of Ahmed Yassavi, who died in 1166. His real name is Sulayman Bakirgani, and he is also known as Sulayman father or Hakim father. The place Bakirgan is located far below the present city of Kungrad. Here, Hakim's mausoleum is still a pilgrimage site, a holy place" [3, 361, 532].

The father of Uzbek archeology, academician Yahya Ghulomov (1908-1977) determined that Bakirgan is really this place based on deep research. "The Karabakhana of the city of Burakhan or Khovand is often mentioned in the 19th century chronicles as the urban slum between the mausoleum of Hakim Ota Bakirgani and Kungirod. According to the opinions of Munis and Ogahiy, the original name of the city slum was called Hovand, but it was known as Bugrokhan. This city is located on a big hill - near Mashankol. That's why he covered the city with water when there were floods in the lake" [12, 158, 159].

We can read the following lines in Abulgazi's "Shajarayi Turk":

"At that time, wheat was planted from the Mazdukhana fortress to the land called Koygun from Bakirgan. Our Khan (Arab Muhammad Khan era) digs a ditch above the Turkish fortress. After a few years, the width of the ditch became impenetrable. Then he went to the Achi (Aral) sea" [2, 161-162].

So, even in the 18th century, Bakirgan was known as a place name.

Zaki Validiy Togon (1890-1970), the world-famous Bashkir orientalist, came to Kungrad in the autumn of 1920 and wrote down the following information in his book "Memoirs":

"Kungirat is the regional center of Khiva Khanate. Although it is a small city, it has a name on the map like Hamburg in Germany, Manchester in England, and Shanghai in China. In the 10 th century, this city is called Bakirgan on the geographical map of the Arabs. It is a village in the north-west of the present Kungyrat. Here is the mausoleum of the famous painter Sheikh Hakim Ota Bakyrgani. He wrote mystical poems for us in Turkish. A number of scientists are conducting research on his work in Russia and Turkey. In 1857, Hakim's "Book of Screaming" was published for the first time in Kazan. I read and memorized his poems when I was little. Taking advantage of

our one-hour stop in Boqirgan, I visited the grave of Shaykh Kamina and wrote the following lines in the memory notebook of the mausoleum, which I remembered from my childhood:

No one could count the number of blessings given by the Sultan.

Will Subhan come back after giving faith?

They ride on lions, whip snakes,

Dervishes with their heads on a brick, and their knees" [11, 107].

So, according to him, Bakirgan is the old name of the city of Kungrad. This is Bakirgan, the city where Hazrat Hakim's father consciously lived and worked in the country of Bakirgan, and spread Islam and the Yassaviya sect outside of it. As it happened in our history, the name of the country was named after the capital, but the name of the country did not change even when the capital was moved to Madmina. The city of Bakirgan remained the religious capital and center of the country.

Bakirgan's name Kungrad can be explained by the arrival of many Kungrad tribes in this area during the 13 th-16 th centuries [5, 8-9].

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Rezyume: Maqolada Sulaymon Boqirg'oniyning dunyoqarashi ma'no va mohiyat jihatdan ko'p hollarda Yassaviy «Hikmat»lari bilan yaqinligi, ular bir-birini mantiqan to'ldirishi, ularning asarlari xalq orasida sevib o'qilganligi va ommalashib ketganligi xususida so'z yuritiladi. Shuningdek, Hakim ota to'g'risidagi afsona, rivoyatlar asosida uning Amudaryoning quyi oqimida - Orol dengizining etaklarida Boqirg'on degen joyda tavallud topganligi va dafn qilinginligi haqida ma'lumotlar keltiriladi. Ushbu ma'lumotlar taniqli olimlarning faktik ma'lumotlariga asoslanadi va tegishli xulosalar keltirilib o'tiladi.

Резюме: В статье говорится о том, что мировоззрение Сулеймана Бакыргани близко по смыслу и содержанию к «Хикмату» Ясави, что они логически дополняют друг друга, что их произведения любимы и популярны в народе. Также на основании в легенде и комментарии Хакимата приводятся сведения о том, что он родился и похоронен при низовьях Амударьи - у подножия Аральского моря, в месте под названием Бокирган. Данная информация основана на фактических данных известных ученых и сделаны соответствующие выводы.

Kalit so'zlar: Turkiy xalqlar, tariqat, tasavvuf, xaritalar, tadqiqotlar, xulosalar, Xovand, Madmina, Orol dengizi, Ustyurt, Qo'ng'iro't, Xo'jayli, «Hakim ota» maqbarasi, karvon yo'llar.

Ключевые слова: Тюркские народы, культ, суфизм, карты, исследования, выводы, Хованд, Мадмина, Аральское море, Устюрт, Кунград, Ходжайли, мавзолей «Хаким Ата», караванные пути.

ECOTOURISM AS A FORM OF ENVIRONMENTAL EDUCATION

Nagashybayeva A.K.

Karakalpak State University named after Berdakh

Summary: *The questions of the organization of ecological tourism as a form of ecological education is considered in this article. Ecological tourism promote formation of ecological culture, norms, valuable ecological orientations, form abilities to be guided moral by both precepts o law and rules of ecologically competent behavior in environment.*

Key words: *ecological culture, rounds, reserves, wildlife areas, natural monuments.*

Ecological tourism is the only direction in the tourism industry that is primarily interested in preserving nature and its environment: monuments, plants, animals. An integral part of the development of ecotourism is the promotion of recycling, conservation of water and energy and the creation of economic opportunities for local communities.

The main goal of ecotourism is to familiarize tourists with natural values, environmental education and education of the younger generation. A feature of the organization of this type of tourism is to ensure minimal impact on the natural environment when organizing trips, creating a network of ecological hotels, providing tourists with environmentally friendly food, etc. Ecotourism includes visits to ecologically clean natural areas (reserves, wildlife sanctuaries, botanical gardens, national parks) not altered or minimally altered by human activity.

Ecological tourism contributes to the formation of ecological culture, norms, valuable ecological orientations, forms the ability to be guided by moral and legal norms and rules of environmentally competent behavior in the environment. For many countries, ecotourism is the main branch of the economy. For example, in such countries as Costa Rica, Ecuador, Nepal and others, ecotourism represents a significant part of the Gross National Product and the local economy.

The year 2002 was proclaimed by the United Nations as the "World Year of Ecotourism". There are two main international organizations responsible for eco-tourism, the United Nations for the Environment (UNEP) and tourism WTO. These organizations are called upon to open a broad discussion about the contribution and development of ecotourism, about the exchange of information, about methods for extracting lessons, developing marketing.

In the Republic of Uzbekistan, large-scale measures are being taken to develop ecological tourism. This area can significantly improve the standard of living of the population, create new jobs and strengthen international relations. The successful implementation of the tasks set in this direction in Uzbekistan testifies to the correct understanding of the importance and significance of the development of the sphere, as one of the factors for the sustainable development of the state as a whole.

The objects of ecological tourism include practically untouched corners of nature. The tasks of ecological routes include ecological training, ecological education, outdoor recreation, conservation of nature in the route zone. Therefore, within the framework of ecotourism, eco-educational tours, tours in ecosystems, and photo hunting can be distinguished.

Seven criteria for ecotourism have been adopted in academic circles:

- remote places of nature under the protection of special organizations and individuals;
- reducing the negative impact on the environment, including hotels, roads;
- control over the number of visitors and their behavior aimed at reducing damage to the ecological system;
- education of environmental literacy;

- profit from ecotourism or some part of it, intended for the preservation of the environment, science and education;

- eco-tourism helps local residents to participate in decision-making;

- respect for local culture;

- support for the democratic movement and protection of human rights.

As directions for the development of ecological tourism can be identified:

- organization of eco-educational tours for schoolchildren and students in accordance with the curricula;

- photo hunting for animals and birds in natural conditions;

- tourist trips through picturesque landscapes with accommodation in tents, cooking on a fire;

- tours of natural areas and acquaintance with their flora and fauna;

- local history tourist routes;

- ethnographic tours, allowing you to get acquainted with folk culture, traditions, customs.

Thus, tourism as a means of environmental education plays a huge role in educating the younger generation, as well as creating economic opportunities for local communities.

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Rezyume: Maqolada ekologik ta'lim shakli sifatida ekologik turizmni tashkil etish ko'rib chiqiladi. Ekologik turizm ekologik madaniyatni, me'yorlarni, qimmatli ekologik yo'nalishlarni shakllantirishga yordam beradi, atrof-muhitda ekologik jihatdan ta'sir ko'rsatadigan xatti-harakatlarning axloqiy-huquqiy normalari va qoidalariga amal qilish qobiliyatini shakllantiradi.

Резюме: В статье рассматриваются вопросы организации экологического туризма как форма экологического образования. Экологический туризм способствуют формированию экологической культуры, норм, ценностных экологических ориентаций, формируют умения руководствоваться моральными и правовыми нормами и правилами экологически грамотного поведения в окружающей среде.

Kalit soʻzlar: ekologik madaniyat, qoʻriqxonalar, buyurtmaxonalar, hayvonot dunyosi hududlari, tabiat yodgorliklari.

Ключевые слова: экологическая культура, туры, заповедники, заказники, природные памятники.

**PREPARATION OF ATHLETES FOR COMPETITIONS AND STAGES OF
DEVELOPMENT OF PHYSICAL ACTIVITIES**

Akimov N. T., Qazaqbaev A. M.

Karakalpak State University named after Berdakh

Summary: *In the article, the adaptation of athletes, as well as the objective and subjective factors that mediate it, are always different in different sports, in this case, it is said that the use of means to accelerate the adaptation of the athlete in the conditions of competitive struggle, the study of the possibilities of using the deferential approach lead to high results.*

Key words: *Physical education, sport, adaptation, objective and subjective factors, sports activity, adaptation period.*

The issue of using mass forms of physical education and sports remains open. The first place is the individual training, which is carried out individually, in the training of athletes through physical training, their correct choice of each type of sport and their adaptation is a very important process of its own. The adaptation of athletes, as well as the objective and subjective factors that mediate it, are always unique in different sports. In this case, the use of tools to accelerate the adaptation of athletes in competitive conditions, studying the possibilities of using a differential approach will lead to high results.

The changes in the social system that have occurred in recent years require the strengthening of research aimed at studying the adaptive capabilities of a person. The problem of adaptation to the conditions of activity has attracted the attention of researchers for many years, from time-to-time interest in it increased (for example, in the 70s), and then it declined. In most of the implemented works, adaptation to the specific characteristics of the activity was studied, not to the conditions of its implementation.

At the same time, it is especially important to study adaptation in sports activities, because sports are a unique model for studying many psychological phenomena manifested in extreme activities. However, existing research does not meet the demand for developing a theory of mental adaptation. Most of the works devoted to adaptation to competitive activities are methodological rather than scientific.

Adaptation is one of the main concepts in the whole complex of sciences. The concept of adaptation is metascientific and is used in various fields to describe human interaction and balancing processes with respect to the environment. There are reasons to agree with the opinion of B. Berman, who believes that the study of almost all mental phenomena (processes, states or properties) is a specific problem of adaptation, because their goal is always research aimed at solving problems and looking for ways to improve the efficiency of human adaptation to the environment.

Acquaintance with the scientific literature on the problem of adaptation shows that two most intensive periods can be distinguished in its study: these are the 70-80s of the 20th century and the beginning of the 21st century.

Initially, the problem of adaptation interested researchers more in its biological aspect than in its mental and social aspects. The long-term priority of biomedical sciences in the study of the phenomenon of adaptation has led to the fact that the issues of social adaptation (compared to biological) have not been studied so widely.

Despite a lot of theoretical and experimental work on adaptation, there are currently a number of problems related to defining the main concepts, studying its role in professional activities in general and sports in particular.

At the moment, the conceptual and terminological basis of adaptation theory remains incomplete. Its imperfection lies in the lack of a clear and generally accepted approach both in the interpretation of basic concepts and in solving more specific problems (levels, types, adaptation, etc.).

The main concepts of the theory of this phenomenon are adaptation, adaptability and flexibility. Let's reveal the essence of each of them and their relationship.

The most successful definition of adaptation is A.N. Nikolaev's definition of human adaptation "as a set of reactions based on his adaptation to unusual conditions of life and activity."

One of the biggest problems in defining the concept of adaptation is that researchers have not concluded about the process, state, or identity. The author himself believes that there are three levels of adaptation. As a process (adaptation itself), it can be considered as a set of adaptation reactions of the individual to the environment.

Adaptation at the level of quality is the level of development of important adaptive qualities (flexibility). Adaptation at the state level is the level of adaptation (adaptation of a person to the environment). This approach to the study of adaptation is holistic and comprehensive. All three aspects of adaptation are dialectically interrelated. Adaptively important qualities are a factor in the process of adaptation, and adaptation is its result.

It should be noted that the study of adaptation in its "pure form" (as a set of adaptive reactions) is very complicated. But flexibility and adaptability are relatively easy to learn.

As mentioned above, the success factor of the adaptation process is flexibility or a set of important adaptive characteristics of a person. At this time, it is not decided which personality traits are most important. However, it is clear that the neurodynamic characteristics of the individual (nervous system and temperament characteristics) play an important role, because during ontogenesis, the nervous system and temperament characteristics are more stable and determine the level of development of certain volitional qualities.

Adaptation is the result of the process of adaptation or "the level of real preparedness of a person. It is a relatively constant strength and characteristic of a stimulus, resulting in a non-specific and specific action in the body as a result of long-term, continuous or periodically repeated (during the period of adaptation) movement is a set of characteristic changes.

Adaptation is the degree of dynamic balance between the subject of adaptation and the environment.

The relevance of studying the adaptation of athletes to competitions and the possibility of accelerating it using a differentiated approach to the formation of the flexibility of athletes is related to the research conducted on the role and regulation of many previous studies. Very little research has been done on the signs of other adaptation states in the athlete's pre-start condition. The factors of athletes' incompatibility with the conditions of competitive activity remain to be determined. Until now, not only the tools to accelerate adaptation and, accordingly, the formation of the state of adaptation, have not been developed, but also the scientific basis for this has not been created, because its components have not been studied.

Except for the research conducted by A.N. Nikolaev. However, this more reflects the psychological aspects of the athletes' adaptation to the conditions of the changed sports environment - competitions on the "foreign" field. In addition, a comparative analysis of adaptation to competitive operating conditions has not been conducted before.

Until now, coaches do not have a complete idea of which athletes and under what conditions it is necessary to provide support aimed at accelerating the process of adaptation to unfavorable and often unexpected competitive conditions. Coaches are not aware of the ways to correct the adaptation process and, accordingly, to form the adaptation state of the athletes. Taking into account the modern achievements of sports pedagogy and psychology, the need to further improve the

system and methods of special psychological preparation of athletes for competitions remains urgent.

Structural and functional modeling of adaptation, identification of its factors and its role in the success of competitive activity, as well as the above circumstances that make it necessary and relevant to accelerate this process, led to the study of the personal characteristics of athletes and raised this topic.

At the same time, it is assumed that a differential approach (taking into account the principles of personal and activity) will be effective in the development and application of the means of regulation of important indicators of adaptation.

This research objective is achieved by conducting empirical studies:

- to determine the adaptability of athletes to the conditions of the competition in accordance with objective and subjective criteria in various sports, as well as to determine the nature of the effect of each of its indicators on the results of competitive activity;
- determining the role of external factors (competitive conditions, social characteristics of athletes) in adapting to competitive activities in various sports;
- to reveal the influence of internal (psychological) factors on the characteristics of adaptation to competitive activities of athletes, taking into account the type of sport;
- to determine the sum of the main external and internal factors that have the greatest influence on the adaptation of athletes in order to base the model and criteria of a differential approach to accelerate the adaptation of athletes to competition conditions.

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Rezyume: Maqolada, sportchilarning moslashuvi shuningdek unga vositachilik qiladigan ob'ektiv va sub'ektiv omillar xar doim turli xil sport turlarida xar qil bo'ladi, bunday xalda, sportchining raqobatdosh kurash sharoitlarda moslashishini tezloshtirish vositalaridan foydalanish, deferetsial yondashuvdan foydalanish imkoniyatlarini o'rganishlar yuqori natijalarga olib kelishlari haqida so'z etilgan.

Резюме: В статье рассмотрены адаптация спортсменов, а также опосредующие ее объективные и субъективные факторы всегда различны в разных видах спорта, в данном случае говорится о применении средств для ускорения адаптации спортсмена в условиях конкурентной борьбы, изучение возможностей использования дифференциального подхода приводят к высоким результатам.

Kalit so'zlar: jismoniy tarbiya, sport, adaptatsiya, ob'ektiv va sub'ektiv omillar, sport faoliyati, moslashish davri

Ключевые слова: физическое воспитание, спорт, адаптация, объективные и субъективные факторы, спортивная деятельность, адаптационный период.

DESIGNING OF THE LEARNER OBSERVATION TASKS

Atashova F., Utepov O.

Karakalpak State University named after Berdakh

Summary: *This article describes the details of the learner observation tasks design. It explains the choice of area for learner observation and the reasons of modification of classroom observation tasks. Description of the task frame, categories is provided.*

Key words: *Arranging a classroom, traditional, horseshoe, modular, overall task, gender indication, graphical symbols, pre-service teachers.*

Typically a classroom consists of a group of individuals who work together in an enclosed room space over a period of time. Numerous methodologists agree that a place plays an important role in ‘encoding the cultural and social understanding of the behavior and actions appropriate to an environment’ [4,62].

In this view, the classroom is a social and pedagogical entity. It is the place where a structure of social interactions develops and evolves where a number of events happen and influence students' behavior. In other words classroom environment involves more than the interaction between teacher, learners, and learning materials or activities: ‘they are social as well as educational actions which will be conducted in a real-world setting which is characterized by a number of pragmatic and attitudinal factors’[6,155]. Classroom size, light, furniture, classroom design, equipment constitute pragmatic factors layout of the classroom with the pragmatic factors inclusively is supposedly designed in a way that supports social climate in the classroom and teaching/learning process. While there probably is an infinite number of ways of arranging a classroom, three are most common: traditional (three or four straight rows), horseshoe (semi-circular rows), and modular (a small-scale design).

Seating arrangement, teaching methods and patterns of behavior

The particular seating arrangement determines as the teaching method as the students' behavior. The traditional straight-row arrangement which is predominating in most educational settings is designed for information delivery methodology. It places the primary interaction focus on the teacher and minimizes student-student communication. With regard to the horseshoe arrangement, it would be the best if both student-student and student-teacher interactions are important to the learning in the class. Classes such as those enhance problem solving discussion and increase ego involvement of most students. The modular arrangement is advocated for classes in which student-student interaction is most important. If groups are formed in the class, this arrangement permits maximum interaction among students within a group while minimizing the interference of one group with another. This arrangement is also recommended for classes which require that the teacher work closely with individuals or groups rather than primarily with the class as a whole.

Location within the seating arrangement implicitly verifies patterns of behavior and student-student, students-teacher relationship. The classroom patterns involve traditions, set of beliefs and recipes for both teachers and students ‘in the sense that there are tacit understandings about what sort of behavior is acceptable’ [3,24]. The straight-row arrangement requires highly motivated students who demonstrate respect and obedience towards the teacher. In the horseshoe arrangement teacher and students share the focus, and students are supposed to demonstrate mutual respect and tolerant behavior towards the teacher and each other. In modular arrangement the focus is shifted towards students. The behavior within a group is more complex as every student with his/her specific character may take active position. Thus every student may exhibit as verbal as emotional behavior and bring some alteration into relationship and social climate over a span of time. The

term 'social climate' refers to the emotional atmosphere present in the classroom. Classroom climate can range from a non-threatening, supportive, free atmosphere, to classrooms where hostility, frustration, tension, and anxiety dominate all relationships. In social and psychological studies the key tenet is the assumption that the emotional atmosphere, or 'climate', in which a group works, exerts a directive influence on behavior and people's relationship. In classroom situations where conditions of good climate exist, there is opportunity for students to express themselves freely; moreover, they work more cohesive as a social group. Group cohesiveness determines to a high degree the development of cognition of its members. This idea is traced in various learning theories, such as Vygotsky's theory of social development, Bandura's (1993) social learning theory, Johnson and Johnson's theory of cooperative learning. [1]

Psychological studies of group behavior have found that individuals behave differently in groups than they do when they are alone. 'All groups possess a power to influence and establish their own norms of behavior and attitudes within their community' [2,39]. What is more all groups tend to make members conform to these norms and values approved by the group. The values established by the group can vary in extremes. A group may display an atmosphere in which the members feel free because of prevailing kindness and friendliness. In another group, an atmosphere of suspicion, jealousy, or high competitiveness may exist. The kind of pressure that operates to influence individual behavior can be overt and subtle. It can range from mild teasing to strong ridicule if the group member fails to conform. But an observer should take into account that a classroom group does not always give overt evidence of being a cohesive unity. Sometimes a quarrel over an incident that happened during the play period does not indicate the class group is not friendly, or a vigorous disagreement over group work shows a lack of solidarity. That is why every situation should be treated and reflected within a specific context.

The overall task (see Appendix 1) is targeted to raise awareness with student teachers about the factors that enhance positive classroom climate and classroom discipline respectively. The second task relates to gender differences in physical behavior and attitude to each other, the teacher and the lesson in general. Another concern of the task involves studying students' preferences for seats within different types of seating arrangements. The more advanced aim is to give student teachers a hint about the type of communication as well as the amount of communication that learners produce in different classroom arrangements.

This task is accomplished during the first meeting of a trainee with the class group. Student teachers are recommended to take a position aside from the pupils' desks to notice facial expressions, emotions and any other physical motions every time the teacher attends to an individual or small group of learners. I have chosen the procedure of teacher's attendance to learners as a measurement of learners' behavior. Although it does not indicate the frequency of occurrence of learners' behavior but it gives a student-teacher the idea about the techniques of classroom management, student-student, and teacher-students relationships in particular. For example, if a learner is doing another task different from the lesson objectives the teacher keeps the situation on alert and might attend to the pupil immediately. A grid of learners' seating arrangement should give student teachers a rough idea about the method that the teacher employs as it is described above. Gender indication is important as it provides a good picture of social climate and relationship, and teacher's techniques of classroom management. Student teachers are guided with some graphical symbols that reflect this or that physical behavior which typically occurs in the classroom. At the same time pre-service teachers feel free in adding any other symbols for different behavior than is indicated in the case if they notice during observation. We have introduced graphic symbols to put against every student on the grid without verbal description as symbolic indication is more feasible. This technique permits pre-service teachers to capture non-verbal behavior that occurs very fast in real time. The system provides graphic symbols that are internationally recognized and comprehensive. Moreover, graphic symbolic indication simplifies the design and

further analysis. Graphic symbols reflect concrete non-verbal behavior and allow an observer to keep and recall the events that have happened during the lesson very easily. After the lesson student teachers have more time to describe the behavior they observed in more precise words while reflecting on the influence of physical behavior of students on the classroom climate.

Student teachers are guided with three additional tasks. They are recommended to make some field notes on the learner's response to the teacher's attendance. Fixing actual utterances that are produced by learners should promote further recollection of the type and the amount of language produced by the pupils in different positions. Another task provides the idea about learners' behavior and comfort while changing their positions. Pre-service teachers should capture the 'action zone' of students where they feel free in movements without disturbing each other physically. Finally, student teachers are asked to notice and fix the behavior of learners in two time intervals, at the beginning and at the end of working on the task in a new seating arrangement. In so doing student teachers should infer learners' preferences for seating arrangement and the amount of time they can work together comfortably. [5,123]

After the lesson student teachers are recommended to comment on all the tasks mentioned above immediately. During further post-observation discussion they continue their reflection on the relationship between seating arrangement and social climate in the classroom. Analyzing gender-related differences in physical behavior pre-service teachers will infer learners' attitude to each other, the teacher and studying process in general. As it was mentioned above analysis of the type of utterances and their amount will lead student teachers to infer the influence of seating arrangement on learners' involvement into the lesson and their progress in learning accordingly. Finally, student teachers will plan their future lesson in accordance with learners' comfort and preferences for seating positions that provides effective classroom management and eventually enhances pupils' learning progress.

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Rezyume: Ushbu maqolada o'quvchilarni kuzatish vazifalarini loyihalash tafsilotlari tasvirlangan. U o'quvchilarni kuzatish uchun maydonni tanlash va sinfda kuzatish vazifalarini o'zgartirish sabablarini tushuntiradi. Vazifa ramkasining tavsifi, toifalari berilgan.

Резюме: В этой статье описываются детали дизайна задач наблюдения за учащимися. Объясняется выбор области наблюдения за учащимися и причины изменения задач наблюдения в классе. Приведено описание рамки задачи, категорий.

Kalit so'zlar: Sinf xonasini tartibga solish, an'anaviy, taqa, modulli, umumiy topshiriq, jins ko'rsatkichi, grafik belgilar, chaqiruvgacha bo'lgan o'qituvchilar.

Ключевые слова: организация классной комнаты, традиционная, подковообразная, модульная, общая задача, указание пола, графические символы, дослужебные учителя.

**THE IMPORTANCE OF THE ROLE OF IMPROVING SPIRITUAL AND IDEOLOGICAL
EDUCATION IN THE NEIGHBORHOODS IN THE DEVELOPMENT OF THE CIVIL
SOCIETY**

Bayrieva A., Ganieva G.

Karakalpak State University named after Berdakh

Summary: *The article talks about the improvement of spiritual and ideological education in the mahallas, the education of young people as perfect people.*

Key words: *family, spirituality, education, spiritual value, national culture, national consciousness, education, courtesy.*

Every age puts its own demands on people, and if they are accepted, they should be answered. But in its turn, the demands are also divided into groups. This is one of the stable rules of life.

One of the pressing issues facing today's education branch is the issue of educating young people to be perfect people.

In order to solve these problems, we should go beyond the boundaries of the school and improve the educational work together with the family and the mahalla (neighborhood) in order to provide the child with full spiritual maturity. The neighborhood action and activeness are of great importance. That is because it is considered one of the main branches of social education. The advantage of the neighborhood is that people who have lived together for many years live together like a regional family and are brought up like children of the same parents. There are traditional education methods in the neighborhood, and they have passed several traditional life trials and experiments. For example, the people are combined to a socially useful work by the khashar method, and they help each other in difficult times. They celebrate "Nawriz", "Altin Toy", "Mushel Toy", "Shashiw Toy" and a number of other national ceremonies all together. This is undoubtedly of great educational importance and helps to promote morality, preserve and enrich our nationality, and strengthen the family as the basic foundation of society.

On the basis of educational institutions, it's necessary to organize the "Parent Education" activity which gives pedagogic, legal, psychological, spiritual-enlightenment education, to learn the families with good child education together with relevant institutions, and to propagate their experiences.

It is necessary to discuss about the families with poor mental health together with the elders of the neighborhood at the community meetings, learn public opinions on them and to solve the shortcomings in this regard as much as possible.

The effective work experience of the neighborhoods, the methods, traditions and customs of our people in the spiritual education, as well as the goals of improving the work on the search for new and effective methods of educational work conducted with the young people, bring out the need to open spiritual and enlightening centers on the accommodation. The spiritual and enlightening center is a system of social education and it is aimed at solving social problems on the accommodation of the authorities, neighborhood associations, factories, public shelters, schools, extracurricular educational institutions, and deters the negative effects in carrying out educational activities among all strata of the population, primarily among children and adolescents and unites the forces of society against them. [1.55]

This new system of schools, workplaces, social organizations, provides practical opportunities for improving the moral, ideological-political, work, economic-ecological health and physical education of children and adults, meaningful spending of free time, the full, rational use of material base and employees of culture, sports, public education, enterprises, organizations and neighborhoods.

The advantage of the spiritual-enlightenment center is that it implements folk, national basis and traditions of education in the process of continuous education. Such centers ensure the increase of the effectiveness of the educational work of the neighborhoods, and have a spiritual impact on all children and adults.

The activities of spiritual-enlightenment centers try to encourage the provision of all educational, physical healing, cultural recreation, and improve the enlightenment activities by sharing the population into different groups according to their residences. Governments, public education bodies, local communal households, neighborhood committees, law enforcement agencies, health care institutions, representatives of enterprises should achieve full cooperation in planning and organizing the educational activities of the residents.

In the provision of personnel for spiritual and educational centers the departments of public education, community welfare and assistance are among the most important ways to achieve great achievements.

The neighborhood has its own style of life, regardless of who they are, they obey its rules, help each other, and are together at weddings and outdoor works. That is why the way of life of the neighborhood leaves a pleasant impression on the consciousness of those who live in it. In the neighborhood, there is a system of informal social relations. If there is a special event, all the neighbors will be at the service by the word of the elder. [2.27]

Everyone tries to protect the honor of the neighborhood. The principle of obedience to the opinions of the community and elders prevails here. This thing is related to Eastern spirituality. For that reason, there are expressions like "Your neighborhood are your parents" and "Seven neighborhood parents for one child" among our people, and even in the happiest and most difficult days of people, the neighborhood helps people's day, supports them, unites the people. The content and meaning of the above-mentioned expressions are deep, and they appeared as a result of marital trials. Therefore, among our people, they are still living with new content.

Nowadays, the neighborhood is considered a spiritual center for many people. Because here there are events that serve as examples for people, as well as events that give warning and motivation. If the spiritual center in the community is low, then there will certainly be crimes there. Therefore, the spiritual center unites both the person and the entire generation in a certain direction, educates them, implements positive sides, and protects them from all kinds of bad things. The spiritual center determines the fate of any achievements or discoveries (including new values received from outside); or it develops, or it forces it to be forgotten, or it deforms it, and it adopts itself.

The spiritual center is the requirements of the society and the procedure for their implementation, which have arisen in the average level of emotional, mental and spiritual development. The center, as a rule, strives for stability, and uniformity, its requirements and influence are the same for everyone - average. In order to meet his demands, people train themselves and adapt. To some of them the requirements of the spiritual center lacks. In this case, there is a risk that the opportunities of individuals or creative groups will not be fully realized. Therefore, there are class, professional-professional or group centers that are relatively unique within the framework of spiritual centers. A clean atmosphere and nature play a big role in the development of every young person, especially school-aged children, as a spiritually, mature person.

One person asks the great Greek scientist Democritus;

- What can you say about today's youth?

- Today's young people do what they know, they have lost respect for elders, respect for young, they have become independent. In order to prevent this, it is necessary to strengthen education in the family and in the neighborhood, - answered the wise man.

Therefore, the neighborhood is considered to be the place where people from history live with common their goals. It has been a sacred place that reflects the characteristics of our people's life style, spirituality, and social life, delivers national traditions, customs, and moral values from generation to generation. The neighborhood is considered a big family that unites people in the path of good, regardless of their nationality, age, gender, religion, language, belief, and social origin, personal and social status. This family is built on the basis of mutual respect, love, and strong friendship of people.

The family and the neighborhood are connected with each other overall. Just as children are trapped in a family, the family also works in the neighborhood, strives for the future, and tries not to be left behind by other families. As a result, both spiritual and material self-sufficiency is becoming stronger. At the right times, the neighborhood becomes the closest advisor and support of every family. The most important quality for the peoples of the East is to be a companion and support each other both on happy days and on bad days. [3.103] The neighborhood is an important source of communication and relationships between people.

It would not be wrong to say that the neighborhood, which played a historical role in improving the life culture and solving many problems in Uzbekistan, was one of the first factors in the people's coming to the front as a people. The neighborhood is a unifying force and is considered a part of the country. Residents are aware of the achievements and shortcomings of the neighborhood. As a result of people knowing each other well, kindness appears in the environment. All these are among the most precious national signs that have spiritually matured our people and elevated them to the ranks of cultured nations. The neighborhood can also be called a family fortress. Learning the history of the nation begins from the learning the history of the neighborhood.

During the captivity, many life problems in the neighborhoods have found their solutions. Weddings and holidays, as well as Hayt Khashars, do not pass without residents of the neighborhood. Social opinion regarding political, economic and other issues is common in the neighborhoods. This is the way of life of our people, the way of thinking and feeling inherited from our ancestors. Life itself demands to develop communities and support them. At a time when multi-faceted reforms are being implemented in our country, it is necessary to serve the community as a reliable support and influential force for the society [4.9].

In order to revitalize the activity of the neighborhood and strengthen their influence, several exemplary decrees and regulations of the President and the Oliy Majlis of the Republic are being implemented. Among them, we can cite the regulation "On self-governing bodies of the people" as an example.

A neighborhood is a small state in a big state. That is why, as well as its management system, its own socio-economic and cultural-enlightenment activity mechanism is also adapted during the captivity.

In the neighborhood, special events for people living in it are being held. For example: "Qánekey qızlar (Come on, girls)", "Jigitler sultanı (Sultan of boys)", "Jaslar gárezsiz turmıs bosagasında (Young people on the edge of independent life) ", "Do you know your rights? (Huqıqınızdı bilesizbe?)", "Shańaraq – jámiyet tayanışhı (Family - the basis of society)", "Qayın ene–kelin múnásibetleriniń ádeplilik-ruwxıy tiykarları (Ethical and spiritual aspects of mother-in-law-daughter-in-law relations)" and others.

According to this regulation of the Oliy Majlis of the Republic of Uzbekistan, the neighborhoods were given great rights, their management was expanded, additional states were separated from the budget, and the distribution of pension to underprivileged households was entrusted to the neighborhoods.

According to the Decree of the President of the Republic of Uzbekistan "On the Development of the Charitable Fund of the Republic of "Mahalla" dated September 12, 1999, it

is said that the fund was created for the purpose of support and strengthening measures of carefully nurture the historically formed national spiritual values, spread them among our people, and launch cultural and educational activities in the republic's neighborhoods, as well as promote them socially and economically. Also the "Ministry of Family and Neighborhood Support" was formed according to the resolution of the Presidential Decree No. 4602 of April 18, 2020.

In our Shariah, it is shown that every person has rights to each other. Among them, the following are the responsibilities of every child in front of their parents:

1. Support in case of need
2. Serving
3. When called, reply as labbay
4. be ready to things they except sin
5. be polite in talking to parents
6. Provide the parents with clothes if one can
7. Follow the parents
8. Not to give parents the things that you hate
9. Give parents the things that you like
10. Pray for parents, when one prays for himself. [5. 48]

Every parent wants to raise a perfect child. However, we can see in the example of everyday life that the material and spiritual center is the reason for children's corruption and deviance. That's why our people say, "Make relation with the person with good son, If your son grows up, person with good daughter, if your daughter grows up." This is the main methods of education that creates the national spiritual norms characteristic of our people.

In short, it is possible to shape the healthy spiritual center of our society by perfecting the spiritual educational work in the family and the neighborhood in accordance with the modern requirements. These issues of spirituality are considered the most important and rational in the development of the civil society.

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Rezyume: *Maqolada ma'ha'llada ma'naviy-g'oyaviy ta'rbiya ishlarini takomillashtirish, yoshlarni barkamol inson etip ta'rbiyalash haqida so'z yuritiladi*

Резюме: *В статье говорится о совершенствовании духовно-мировоззренческого воспитания в махаллях, воспитании молодежи как совершенных людей.*

Kalit so'zlar: *Oila ma'naviyat ta'rbiya ma'naviy qa'driyat, milliy ma'daniyat, milliy ong, ta'lim-ta'rbiya, odop-ahloq.*

Ключевые слова: *Семья, духовность, воспитание, духовная ценность, национальная культура, национальное самосознание, воспитание, вежливость.*

HISTORICAL IMPORTANCE OF DERIVATION IN STUDYING LANGUAGES

Xabipova R.

Karakalpak State University named after Berdakh

Summary: *The research deals with the significance of derivation of words within one language or languages. This way appears in all languages' lexicology which are close or far away. The given paper tried to show the value of historical and modern derivation in developing languages. Most importantly, the role of relation of derivation was particularly highlighted.*

Key words: *derivational words, word formation, derivative, modern derivation, comparative-historical method, productivity, the relation of derivativeness.*

Derivation is a complex notion which has different contexts but in linguistics the concept "derivation" in linguistics is used in two different meanings. In one meaning, it indicates a historical or diachronic development words either from an earlier form of the word or by adding affix to an existing word, especially the Oxford English Dictionary defines derivation as "Formation of a word from a more primitive word or root in the same or another language; origination as a derivative"[1:3]. As for Webster's Third New International Dictionary, it defines it as "The formation of a word from an earlier word or base usu. by the addition of an affix usu. noninflectional. In a second meaning derivation indicates the formation of a word synchronically from a word which is said to 'underly it'; Webster's defines derivation in this sense: "Relation of a word to its base as expressed usu. in terms of presence of an affix, q . . vowel alternation J . . . consonant alternation" . . . difference of accent J . o . absense of one or more sounds, . . . or zero difference J . . . (2) : the relation of a word to its base when the two do not belong to the same inflectional paradigm[2:13].

In modern linguistics, derivation is just beginning to take shape. Much is still unclear about it; a system of terminology has not yet been created, sufficiently reliable research methods have not been developed, not even the whole range of problems to be resolved has been defined. Derivation did not appear in a vacuum. Formation of modern derivation is a well-known summing up, summarizing the results of the development of linguistics. In this regard, we turn to his history. Already in the ancient world we find separate ideas consonant with the provisions of modern derivation. So, the ancient Indian linguist Panini compiled a grammar that told how the roots of Sanskrit words are formed, what alternations of sounds occur during word formation. It was essentially the world's first derivational grammar. In ancient times, partly independently, partly relying on the Persian and Arabic tradition, scientists made many interesting assumptions about how individual words and their grammatical forms. It is no coincidence that "derivational" linguistic terminology took shape in ancient Greek philology [3:56]. Compare Russian tracing papers: case (indirect cases seemed to fall away from the nominative case), declension (cases deviated from the original, original), etc.

In Russian linguistics, the ideas of this grammar were successfully developed by the so-called logical grammar, the founder which is N.I.Grech. His "Practical Grammar of the Russian Language" had a huge impact on the development of not only the scientific grammar of the 19th-20th centuries, which is still found in school textbooks on the Russian language.

Participial and participial phrases, applications, introductory words were interpreted by logical grammar as sentences "abbreviated" adjectives. Although in reality these turnovers historically, nor derivatively, they were not reduced to subordinate clauses in the literal sense, but they are "raised" to the sentence, i.e. replace it: As we approached the village, we heard dogs barking. = When we were approaching.

N.I. Grech and his followers, including Buslaev, talked about many other derivational processes: fusion (animals and birds live without difficulty), substitutions (I live in a city where = where I am very bored), omissions (they say there will be peace soon = people say) [2:65].

F.I. Buslaev for the first time made an attempt to consider such processes from a historical point of view, i.e. treat them as "historical", occurring in the history of the language. Supporters of the comparative-historical method in linguistics ("historical grammar") did a lot in this direction, although they denied the scientific significance both universal and logical grammar. However, they denied - does not mean they rejected everything that was done by their predecessors. On the contrary, many fruitful ideas of logical schools found not only support, but also development in the works of representatives of comparative historical linguistics.

It's typical before only for the early period of its development, when the psychological concept was "combined" with the conviction that language is a deeply social phenomenon. This postulate was proclaimed the basis of linguistics in the works of the brilliant W. von Humboldt, a German encyclopedist of the 19th century.

G. Steintal proceeded from the linguistic concept of Humboldt and A.A. Potebnya. In the latter's book, *Thought and Language*, an attempt was made concretize and develop the ideas of W. von Humboldt. A.A. Potebnya showed that the historical formation of language is closely connected with mental processes, that the forms of language (words or sentences) are ultimately determined by the need for expression of thought, and that along this path it is necessary to look for laws that govern both languages, as well as thinking.

Language in direct observation is an uninterrupted process, constant activity of communication, expression and formulation of thought in linguistic (material) forms. But every activity has a certain result, a certain product. So the language is activity presupposes language as the product of this activity. Its two sides of the same phenomenon - language: dynamics and statics [3].

They constitute a unity, but a dialectical, contradictory unity. Statics deals with a list of units (it does not matter in what form they are presented, in the form of a simple aggregate or in the form of a strict system) with some given, ready-made material for research and use; she states facts (linguistic data) and captures some relationship between them. On the contrary, dynamics deals with linguistic processes, with the rules for the formation of units, with the functioning of language as a means of communication. It is clear that statics is a moment of dynamics. Figuratively speaking, static is a frame in a film, and dynamics is a film. True, any comparison is lame: a certain sequence of film frames is a film, meanwhile, the sequence of "statics" - static relations of the language - is not its dynamics. Rather, on the contrary, statics, as it were, is extracted from dynamics, statics is always the result of our research, abstraction from the actual state of affairs.

As for the other meaning of this term - the relation of derivativeness - it no longer refers to the dynamics, but to the statics of the language. Indeed, any relation is a relation between given units. We establish the derivative relations after how the process of unit formation took place, we kind of compare coexisting two units and find some difference in them, which allows us to qualify one of them as a derivative from another, i.e. to assume that one was produced (formed) from the other.

For example: in the dictionary of the Russian language, we record two words: tea and teapot. Comparison of these words shows that one of them is more complex and, as it were, "includes" another: a teapot consists of tea + nick. The same is observed in the field of syntax: Snow began to melt - The snow began to melt rapidly. Here the word violently fulfills essentially the same function as the nickname in the teapot. Such an inclusion relation is called a derivative relation. It would seem that we should consider this relationship as a dynamic phenomenon, especially since other relationships that are not directly related to derivation can be established between the units of the language, for example, the relationship of opposition (opposition), which were subjected to a

comprehensive analysis in classical structural linguistics, or relations of embodiment, when some abstract postulated unit (linguistic) is put in correspondence with a specific unit (speech); phoneme - the sound of speech, etc.

Derivation as a process of formation of language units is unobservable. It takes place in the minds of the speakers, and how the derivation proceeds can only be judged by some of its results, by indirect data, by some external traces left in the text, in sentence or word structure. In this respect, derivation resembles physics, which also studies unobservable microparticles of atoms, or chemistry, analyzing a chemical reaction based on composition starting materials and end products [3:8].

The fundamental non-observation of the subject of research is one of the distinguishing features of derivation. However, this feature is also characteristic of structural linguistics, which studied not the sounds of speech, but phonemes, i.e. relations between sounds, not words as such in the text, but relations between *measchu t sh* and *- lexemes*, etc. Relationships are also an unobservable object, *pLdda*, of a different kind. One might get the impression that between the theory of derivational relations and derivation there are no fundamental differences, that they investigate, in essence, the same thing, only in different aspects, hence the different terms, we seem to depict in different ways, represent the same phenomenon: to count is a counter, but count the counter. In reality it's not. Theory of derivational relations and derivation have significantly different starting positions - the statics and dynamics of the language, which cannot but affect the entire system of concepts and methodological techniques of either discipline. Derivation — science is functional, and the theory of derivational relations (TAR).

Otherwise, this issue is considered in derivation. Word formation occurs in several stages. At the first stage, some expansion of the object designation is observed, due to which the most general name (generic concept) is specified, limited to the specific concept. For example, the concept of an agent in general can be limited to an indication of what he is reading. As a result, a semantic construction of the type arises in the mind of the speaker: The doer reads = the one who reads. At the second stage, this construction is collapsed, i.e. the process by which a derivative word is obtained. In this case, the figure = the one who is replaced by the affix *-tel*, the word reads - its basis is reader-. what and gives the reader [4:43].

In conclusion, derivation is important to do some search which requires the exact meaning and a different context. Even some languages are linked to each other by derivative words and they might be a tool which make languages closer.

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Rezyume: *Tadqiqot bir til yoki til ichidagi so'zlarning hosilaviy ahamiyati bilan bog'liq. Bu yo'l barcha tillarning yaqin yoki uzoq leksikologiyasida uchraydi. Ushbu maqola rivojlanayotgan tillarda tarixiy va zamonaviy derivatsiyaning ahamiyatini ko'rsatishga harakat qildi. Eng muhimi, so'z hosil qilish munosabatlarining roli alohida ta'kidlandi.*

Резюме: *Исследование касается значения происхождения слов в пределах одного языка или языков. Этот способ присутствует в лексикологии всех языков, близких или далеких. В данной статье была предпринята попытка показать значение исторической и современной деривации в развивающихся языках. Самое главное, особо подчеркивалась роль отношения деривации.*

Kalit so'zlar: yasama so'zlar, so'z yasalishi, yasaluvchi, zamonaviy so'z yasalishi, qiyosiy-tarixiy usul, mahsuldorlik, hosilalik munosabati.

Ключевые слова: словообразовательные слова, словообразование, производное, современное словообразование, сравнительно-исторический метод, продуктивность, отношение производности.

THE CATEGORY OF GRAMMATICAL CASE IN THE KARAKALPAK LANGUAGE

Khakimov U.K., Kulametova B.K.

Karakalpak State University named after Berdakh

Summary: *This article analyzes the category of possessive case in Karakalpak, which is one of the important problems that needs for further investigation. The analysis of the category of possessiveness is related to the study of grammatical functions of case system. The main notions of possessiveness in Karakalpak are relatedness, ownership, possessiveness.*

Key words: *Karakalpak language, morphology, case system, grammatical category, grammatical meaning, possessiveness, suffixes, affixes.*

In Karakalpak language, as in all Turkic languages the case category is considered to be as an advanced category. Modern Karakalpak language has six cases. Linguist A.Kidirbaev in his scientific work devoted to the case category in the Karakalpak language added the seventh auxiliary case [1: 95].

The grammatical indicators of this case were conveyed by the words *menen*, *benen*, *penen* (*qalem menen*, *at penen*). Here the scientist must have considered it to be based on the auxiliary case in the Kazakh language. However, these elements in the Kazakh language have been shortened and formed as a suffix in the form of *-men*, *-ben*, *-pen*. Karakalpak and Uzbek languages do not have such phenomenon. The above mentioned words are considered as special words and called “conjunctions” (*da'neker* and *tirkewish*). Thus, the Karakalpak language has six cases, not seven: each case has its own specific forms, grammatical meanings and syntactical functions.

Since our work is related to the category of possessiveness, we will express our opinion not about all the cases in the Karakalpak language, but about the possessive case.

The possessive case in the modern Karakalpak language is formed by the affixes *-niń/-niń*, *-ning/-diń*, *-tiń/-tiń*. In most languages of the world, the main notions of possessiveness are relatedness, ownership, possessiveness. They are even more evident in the noun phrases.

The phrase “the property of the farm” (*fermaniń malı*) conveys a clear meaning of communicative function of the possessive case, which is, in this case, formed by the grammatical mechanism of the possessive case to express it. In addition, it is given in the form of a syntactical position of an attribute. Many scholars mentioned about the convenience of such language constructions [2: 89].

In this regard, it is important to determine the social-communicative function of possessive case. For example, in the Russian language, the noun in the possessive case conveying the function of possessiveness can serve not only as attribute but also predicate. In Russian, in the sentence “*etot dom brata*” the word “*brata*” is in possessive case, which serves as predicate as well. In the Karakalpak language, the use of an affix *-diki* is a specific construction rather than a possessive case when serving a communicative function. (This house is my brother's) “*Bul u'y ajag'amdiki*”.

According to the authors of the grammar written in the Turkic languages, the use of possessive case with affix is related to the fact that the noun component indicates a clear and definite object, that is, there are semantic differences between the forms of use with and without affix. A famous turkologist A.Gulomov conducted research on the basis of the Uzbek language materials and concluded that the affix form of the possessive case does not always indicate accuracy. According to him, the attributive function of the case can be found both with and without an affix [3: 67].

However, in certain situations, one form can be replaced by another with no semantic difference or with little noticeable semantic difference. In the Russian equivalents, the difference of these constructions in meaning is not so noticeable. However, in some cases, the use of the

participle with an affix, compared to the use without an affix, their alternative use causes a significant difference. This is related to the position of possessiveness in the context.

The phenomenon is expressed by the possessiveness and connection of the categorical form of the possessive case. This is clarified in the syntactic combination of two noun components.

These constructions are morphologically expressed by the adding of the noun combination of the component which is in the possessive case. They change in the agglutinative languages, and have the possessive case form.

In this case, the noun component in the possessive case functions as an attribute and it is more clear by the form in dative case than the form of possessive case without an affix: “the field of the farmer” (fermerdiń dalası), “the caw of the farmer” (fermerdiń malı), “the reconstruction of the school” (mekteptiń rekonstrukciyası), the garden of the school (mekteptiń bağı), etc.

In the above-mentioned examples, the inconsistencies and incompatibilities are highlighted. For example, in the Karakalpak language, the phrase “the edge of the table” (stoldiń sheti). Here are two pieces of information, two views used in the sense of mutual possessiveness: “edge and table”, the edge belongs to this table, it is connected to it. In this case, the connections are not compatible, because the concept of “the edge” can not be an attribute to the table, the edge is the edge of the table, not the edge. This idea proves that the combination can not be changed and replaced.

It should also be mentioned that in most Turkic languages, as well as in the Karakalpak language, the dative case can be used in the use of the attributive possessive function. In this case, some constructions are very interesting, especially in the colloquial language. For example, in the sentences “cotton plant” (paxta zavod), “flour mill” (un zavod), and “oil plant” (may zavod), the third participle pronoun of the possessive form is lost, omitted. Usually, in the Karakalpak language, it is necessary to use them as “a cotton factory” (paxta zavodı), “oil factory” (may zavodı).

From the point of view of the lexical concept, it is possible to consider it as one form of the specific composition of “khlebzavod” (the factory of bread) and “klopszavod” (the factory of cotton) in the Russian language with the above-mentioned functions of the possessive case and dative case. However, should it be considered as an influence of the Russian language or as a process of language development? In the second case, the morphological indicators get disappeared which is certainly a complicated problem. In any case, it should be said that this process has its own grammatical construction in the Karakalpak language. Here it is good to mention these phrases: “our village” (biziń awıl), “our city (biziń qala), “our school” (biziń mektep). As you realized, in them, the pronoun-possessive case form is left in the first person of the plural form. Such constructions are statistically the typical form for the literary language, especially for the spoken language. It should also be noted that this construction is only component of the pronoun in the first person plural that are made with the possessive case form and noun in the dative case. It is possible to replace the word at the end of the construction, but the previous one – the pronoun – can not be replaced by other person. For example, we can not say “I village”, “he village” or “you village”, but it is possible to say “your village”. This phenomenon is a specific characteristic of the Turkic language, and the Karakalpak language, as well, that differentiates them from others, especially Germanic languages.

In some Turkic languages, the use of quantity is clearly expressed, while in others, uncertainty is noticeable. However, it is necessary to mention that there is not a single language among the Turkic languages that does not express this phenomenon by the affixes of the possessiveness.

The structure of syntactic constructions which expresses geographical features is made up of a dative noun component that notes noun objects. The second of them refers to geographical terms. Such communicative construction can be noticed by the following example: “African animals”.

However, the communicative function of the syntactic construction should be mentioned here. Communicative methods of this case are not the same in most Turkic languages.

Even so, it is necessary to mention that it conveys a whole indivisible meaning. The first component of it can be represented by an adjective. For example: “African animals”, “Caucasion mountains”, etc.

In the Karakalpak language, the noun in the possessive case is used with and without affixes, as in other Turkic languages. The two forms of the use of noun in the possessive case in the Karakalpak language are related to the category of definite and indefinite case, including other reasons. The noun in the possessive case is used with affixes in the following cases:

1. When the noun in the possessive case refers to the speaker and the listener with a known object: “the boy of the village”.

2. The noun in the possessive case is the case of possessiveness and when it has ownership connection. “the market of Khojeli” (Khojeliniń marketi), “I.Yusupov’s songs.” (I.Yusupovtiń qosıqları), etc.

3. When the noun possessive case has a special dative case: “the time of yesterday’s child.” (Keshegi balanıń waqtı), “the meaning of today’s news” (bugungi xabardıń manisi)

4. When there are other words between the noun and the word in possessive case: “the city’s wide streets”, “the new work of poet”, “the previous chairman of the school”, etc.

5. When expressing the same owner of objects: The poet’s songs and poems have been translated into other languages. “The student’s books and notebooks are clean.

6. When personal pronouns and other substantial units of speech are in the possessive case: “As if he had not read my letter, neither he talked nor answered”. “Many people come to the house of the good.

7. When it is necessary to distinguish the word of possessive case and emphasize it. “A child of another school, not our school.

8. When the fractional numbers are in the possessive case: one of three, two of seven, etc.

9. The possessive case is used with and without affixes when it comes in front of auxiliary noun. “In front of friends”, “inside the house”, “in front of the door”.

In some other cases, the possessive case is used without affixes when it expresses grammatical uncertainty, generality in constructions representing geographical terms: “Aral Sea, Chimbay city, Abay street, the doctor of science, the professor of University, etc.

If we change constructions, the meanings will also change, even some of them can not be changed. The “Aral Sea” never changes. “Abay street” means the street named after Abay. When we say “Abay’s street”, we mean the street that Abay lives in.

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Rezyume: Ushbu maqolada qoraqalpoq tilida egalik kategoriyasi tahlil qilingan bo'lib, bu qo'shimcha tekshirish uchun zarur bo'lgan muhim muammolardan biridir. Egalik kategoriyasini tahlil qilish tizimining grammatik funktsiyalarini o'rganish bilan bog'liq. Qoraqalpoq tilida pozessivlik kategoriyasining asosiy tushunchalari qarindoshlik, egalik, mulkdorlikdir.

Резюме: В данной статье анализируется категория притяжательного падежа в каракалпакском языке, которая является одной из важных проблем, требующих дальнейшего изучения. Анализ категории притяжательности связан с изучением

грамматических функций падежной системы. Основными понятиями позессивности в каракалпакском языке являются родство, собственность, стяжательство.

Kalit so'zlar: Qoraqalpoq tili, morfologiya, holat tizimi, grammatik kategoriya, grammatik ma'no, egalik, qo'shimchalar, affikslar.

Ключевые слова: Каракалпакский язык, морфология, падежная система, грамматическая категория, грамматическое значение, притяжательность, суффиксы, аффиксы.

EMOTIVENESS AS A LINGUISTIC CATEGORY

Kaniyazova A.B., Nurakhimova A.

Karakalpak State University named after Berdakh

Summary: *The article presents investigations on the term emotiveness in English language. It discusses the interpretation of the category of emotiveness in different ways.*

Key words: *linguistic category, the concept of emotiveness, descriptions, emotions, linguistic level.*

INTRODUCTION

Emotions are an integral part of human life. They accompany an individual everywhere and they are the most important aspect of human existence. The emotional sphere is the object of investigation of many anthropocentric sciences: philosophy, medicine, pedagogy, psychology, linguistics and etc.

Since our work is mainly related to emotions, we will first consider what emotion is and how scientific disciplines explain it.

In dictionary we can find definition to a word "emotion" -a conscious mental reaction (such as anger or fear) subjectively experienced as strong feeling usually directed toward a specific object and typically accompanied by physiological and behavioral changes in the body; - a state of feeling; - the affective aspect of consciousness. [6].

Our emotional feelings reflect our ability to subjectively experience certain states of the nervous system. Although conscious feeling states are universally accepted as major distinguishing characteristics of human emotions, in animal research the issue of whether other organisms feel emotions is little more than a conceptual embarrassment.

In philosophy, emotions are opposed to reason (the mind) and are considered as an active force that directs the mental and physical strength of an individual to a certain goal.

In medicine, emotions are understood as the property of a living organism, which appeared in the process of human evolution, to respond to an irritant from the external world surrounding it.

In pedagogy, emotions are perceived as indicators that allow to recognize pupil's personality and his state of the inner world, and, accordingly, can be useful in organizing educational processes.

In psychology, emotions are perceived as an internal mechanism that controls the behavior and mental activity of a person, and partly points to the past experience of the individual.

In linguistics, emotions are understood as reflectors of the person's inner picture of the world, that is, psychological sensations are perceived as a subjective reflection of the objective world in the human psyche.

But linguistics applies another name to the inner feelings of a living being, such as emotiveness. The reason for this is that in linguistics emotions are studied through the prism of language, and as a property of language, i.e., emotions themselves are not the object of linguistic research, but the ability of language to express them in various ways. For example, if a person experiences fear, then his feelings are his emotions (psychology), and if he utters sounds like "Aaaaaaa..." or says "I'm afraid" out of fear (linguistics). Then this is already emotiveness, i.e., emotions transmitted using a language- text.

This opinion supported by V.I. Shakhovsky, K.I. Bradunova and some other linguists. In their opinion, emotion is a category of psychology, and at the linguistic level emotions are transformed into emotiveness. "Emotions are a category of psychology, while emotiveness is a language one, because emotions can be conveyed with its help. Therefore, scientists invented the term emotiveness." [2.] Linguist A. B. Zotova also adheres to their definition of emotiveness. She

considers emotionality and emotiveness to be identical, emphasizing the greater popularity of using the term "emotionality" rather than "emotiveness". [8.15]

In addition, similar explanations of the term "emotiveness" are given in the works of D. Hadjieva and A. Bilyalova. The first mentions emotiveness as an influence tool of the author of the text in order to change the reader's picture of the world. The latter asserts: "emotivity is a set of linguistic means capable of producing an emotion genic effect and causing corresponding emotions in the recipient ..." [4.383].

The above-mentioned examples are similar to each other. But there are other interpretations of the term "emotiveness" that differ from them. An example for it can be the definition of L.G. Davydenko, who considers emotiveness as an "emotion for others": "Emotivity as a conscious planned demonstration of emotions is directed at the addressee. This is a controlled demonstration of emotions, which is used for strategic purposes: influencing others, demonstrating loyalty, goodwill, preventing possible conflict, i.e., it performs a social function - to influence the interlocutor's perception of the situation and its understanding." [3.26]

An idea close to this is given by S. I. Kholodionova, who states: "Emotiveness is a metonymy of the reconstructed emotion, that is, a functionally transferred emotion. The concept of "emotiveness" came to linguistics from psychology, where a clear line is drawn between emotion and emotiveness. Thus, a linguistic emotive is understood as a discrete phenomenon, temporary, which can appear and disappear, in contrast to emotionality, which has a non-discrete, permanent essence." [5.171]

Here it can be understood that the above—mentioned linguists do not agree with the opinion that emotiveness is an emotion in the text, but perceive it as a kind of fake emotion. This approach, in our opinion, does not justify the role assigned to the category of "emotiveness" in linguistic research.

Consequently, from the above two groups in determining the category of emotiveness, one can notice their similarities and differences. The similarities are that both relate to emotions. However, the first group notices it, as a verbally expressed emotion, whereas linguists of the second group perceive emotiveness as a false, manufactured emotion. And also, the first group uses the term emotiveness as an auxiliary tool in linguistic analysis, while the second focuses not on the linguistic, but on the psychological nature of emotion. Of course, to prevent confusion in understanding the terms of linguistics, another term should be formed to describe what these two linguists name "emotiveness".

CONCLUSION

As a result, we would like to note that we support the definitions of K.I. Bradunova and her like-minded people who consider emotiveness as a purely linguistic category, since their definitions clearly and briefly explain this linguistic term. Therefore, by giving all types of verbally expressed emotions such a name, we simplify both the text analysis and the understanding of the text analysis containing descriptions of emotional states. Whereas, relying on the definitions of L.G. Davydenko and linguists close to his opinion when analyzing texts can lead to confusion. Because it is not the text itself, but the emotions described in the text that become the main object of research.

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Rezyume: Maqolada ingliz tilidagi hissiyot (emotiveness) atamasi bo'yicha tadqiqotlar keltirilgan. Unda hissiyot kategoriyasining turlicha talqini muhokama qilinadi.

Резюме: В статье представлены исследования термина эмотивность в английском языке. В ней рассматривается интерпретация категории эмотивности по-разному.

Kalit so'zlar: lingvistik kategoriya, hissiyot tushunchasi, tavsiflar, his-tuyg'ular, lingvistik daraja.

Ключевые слова: языковая категория, понятие эмотивности, описания, эмоции, лингвистический уровень.

**HISTORY OF THE DEPARTMENT OF INTERNAL AFFAIRS IN UZBEKISTAN
(INITIAL CHANGES IN INTERNAL AFFAIRS (1991-1998))**

Qosbergenov B.

Karakalpak State University named after Berdakh

Summary: *The emergence and development of the internal affairs department in Turkestan territory, and therefore in Uzbekistan territory.*

Key words: *Khan guard, Kokaldash, People's Commissariat of Turkestan ASSR Internal Affairs*

Historical sources, in addition to military warriors ("guard", "guard", "servant", "shikhna", "yasovul", "kokaldosh", "muhtasib", "guardian", "soldier"), which arose in the territory of our ancient homeland, ("mirshabboshi" and "mirshab") are responsible for guarding the ruler's residence, fortifications and other buildings, maintaining peace and public order in villages and cities, ensuring population protection and fighting criminals, identifying criminals, finding and performed his duties such as punishment.

Historical sources, in addition to military warriors, in the states that arose in the territory of our ancient homeland, "guard", "guard", "servant", "shikhna", "yasovul", "kokaldosh", "muhtasib", "guardian", "soldier", "mirshabboshi" and "mirshab" guard the ruler's residence, fortifications and other buildings, maintain peace and public order in villages and cities, ensure population protection and fight against criminals, identify, find and punish criminals fulfilled his duties.

Historical sources indicate that in addition to military warriors, there were workers like "saqshi", "qarawil", "xizmetker", "shixna", "jasawil", "kokaldash", "muhtasib", "qoriqshibasi", "sarbaz", "mirshabbasi" and "mirshab" in the states that arose in the territory of our ancient homeland who fulfilled his duties such as guarding the ruler's residence, fortifications and other buildings, maintaining peace and public order in villages and cities, ensuring population protection and fighting against criminals, identifying, finding and punishing criminals. The fact that today's internal affairs organizations were formed on the basis of such structures, which in turn indicates that internal affairs organizations have historical foundations closely connected with the history of Uzbek nationalism.

History shows that the names, tasks, and functions of these structures changed in response to the requirements of the political situation at different times. For example, at the end of the 19th century, in Turkestan, which became a colony of the Russian Empire, the system of "policiya-mirshablik" was introduced, which mainly served the interests of the colonial empire. The "policiya-mirshablik" system was engaged in the activities of ensuring the peace of the people, public safety and combating criminals, as well as controlling the movement of the local people, preventing the emergence of people's liberation movements and assisting the military units in combating them.

During the time of the former Soviet Union, the activities of internal affairs organizations (initially called "jumisshi-diyxan politsiyasi"), along with public protection and combating crime, were aimed at establishing the principle of Soviet governance in the region and further strengthening its ideas. The orders and related assignments from the center were made to fulfill on time completely.

With the honor of independence, internal affairs organizations have become the protector and helper of our people, the trust of protecting peace and harmony, public order and citizens' safety in our country. Especially, the reforms carried out in recent years were a fundamental improvement of the system, a social way of internal affairs bodies that provide timely and high-quality assistance

to the people, where each employee considers "serving for people's interests" as their duty gave an opportunity to turn it into a professional structure.

At the same time, there were a lot of self-sacrificing employees who spared their lives in the internal affairs bodies even in difficult times and dangerous situations, and made a worthy contribution to ensuring peace and harmony in the country and fighting crime.

Their hard work, bravery, and heroism were an integral part of the history of internal affairs organizations and will serve as an example for today's and future generations.

We can divide the history of internal affairs bodies in the years of independence into the following periods.

1. Initial changes in internal affairs bodies (1991-1998)
2. Development of internal affairs bodies (1999-2016)
3. The main goal is to serve the interests of the people (from 2016 to now).

Initial changes aimed at improving the cultural and technical conditions of internal affairs bodies and introducing a system of training of qualified national personnel were carried out during the period of gaining state independence and the transition period.

Specifically, on October 25, 1991, based on the order of the Cabinet of Ministers of the Republic of Uzbekistan No. 270, Uzbekistan SSR IIV was transformed into the Ministry of Internal Affairs of the Republic of Uzbekistan. The decision approved the law and structure of the ministry. Later, this date was designated as the day of employees of the Ministry of Internal Affairs in our country.

"Corresponding to these periods, during 1989-1990, a very significant period related to the transition to a market economy prevailed in our country" [1., 37.p.]..

As in every field, the system of the Ministry of Internal Affairs had wide-ranging work, big tasks, and problems waiting to be solved. As a result of the illegal actions of some people who tried to use this situation for their own interests, the number of serious crimes such as drug addiction and religious extremism increased.

However, the leaders of the extremist organizations working in some foreign countries tried to use to destroy the existing criminogenic situation in the territory of our republic, to frighten the people, to instill distrust in the work of law enforcement officers and to intimidate, to make them obey but practical actions were carried out.

Moreover, it is worth noting that, in all these important and trial periods, the brave and courageous employees of the internal affairs bodies, who have fire in their hearts, fought against criminals without sparing their lives for the sake of national security.

We can see the concrete facts about this in the terrorism and various mass disturbances committed in the territory of our republic during 1989-2010. As a result of fighting against these actions by the employees of the internal affairs organizations with great courage and selflessness, many of them died bravely.

On June 3-12, 1989, mass riots occurred in the Fergana region, in which citizens of the Turko-meskhetian nation living in the cities of Margilon, Tashloq, Kogan, Fergana, Kuvasai, and the districts of Fergana, Akhunbabaev, and Uzbekistan were targeted crimes of murder, robbery of their property were committed, and their houses were burned down. As a result of the practical actions taken by the employees of the internal affairs organization, these disturbances, in which more than 70,000 citizens took part, were prevented from further developing, and these disturbances were completely suppressed;

On February 19-21, 1990, mass riots took place in the Boka district of the Tashkent region, and quarrels related to the "40th anniversary of October" state farm and Turko-Meskhetians living in the village of "Tyirabag" escalated. During these riots, 2,000 Turkish-Meskhetians were arrested by the services of local internal affairs organizations and evacuated from the dangerous zone to the territory of Tomashabogent district and placed in the "Kumushkán" sanatorium;

On March 2-3 of the same year, 4 people, including 1 police officer, were killed as a result of a group of people demanding the removal of Turko-Meskhetians from the territory of the sanatorium and continuing public riots. Due to the start of these riots, hundreds of employees of internal affairs organizations took various degrees of physical injuries;

On December 9, 1991, about 1,000 religious people and local residents gathered around the mosques located in the area of the city of Manangan by the members of the "Wahhabi" religious extremist movement, blocking the main roads in the area of the city, inviting the residents to organize a mass strike. As a result, people gathered around the building of the regional administration and demanded the arrival of the first President of the Republic of Uzbekistan I. Karimov. The employees of the internal affairs organizations urgently took special preventive measures to prevent this process from turning into mass riots;

“On May 5, 1994, police officer B. Kuchkarov, who was serving at customs block post No. 4 in Uchkurgon district, Namangan region, actively fought against the attack of members of the religious-extremist movement, and died heroically in the shooting while faithful to his duty” [1., 78.p.].

On December 17, 1998, on the border of Minasip district of Khorezm region with Turkmenistan, two terrorist group fighters attacked border guards and employees of the Ministry of Internal Affairs, who were serving in this area, and the employees of the Ministry of Internal Affairs A. Kuwandikov and M. Macharipov were injured. As a result, on December 29, customs officer B. Avezov and S. Eshhniyazov, an employee of the Ministry of Internal Affairs, were heroically killed in a shootout with members of four terrorist groups on the border region with Turkmenistan.

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Rezyume: *Ushbu maqolada mustaqillik yillarida O'zbekistonda Ishki ishlar organlarining rivojlanish tarixi, uning bosqichlari haqida aytib o'tilgan holda, hozirgi davrga kelib bu sohaning zamon bilan hamnafas rivojlanishi uchun qanday ishlar amalga oshiriliyotganligi hamda oshirilishi kerakligi tog'risida tahlil qilindi.*

Резюме: *В этой статье были упомянуты история развития трудовых органов Узбекистана за годы независимости и его этапы, а также какие работы проводятся и должны быть увеличены для развития этой сферы в соответствии со временем до настоящее время.*

Kalit so'zlar: *Xon yasovuli, Kokaldosh, Turkiston ASSR Ishki ishlar xaliq komissairati*

Ключевые слова: *Ханская ясовул, Кокалдаш, НКВД Туркестанской АССР*

LEXICAL-SEMANTIC ANALYSIS OF THE 'MUHABBAT' (LOVE) CONCEPT IN THE NOVEL "TERBENBES"

Sadullaeva A. N.

Karakalpak State University named after Berdakh

Summary: *This article describes the life, love, heartbreaks of the main character Lepes Bay, as well as the concept 'Muhabbat' (love) delivered through stylistic devices, lexemes and phraseological units in the novel "Terbenbes" by Karakalpak writer Qipshaqbay Matmuratov.*

Key words: *Concept 'Muhabbat' (love), lexical-semantic, phraseological units, lexeme, word order, metaphor, tropes, hyperbole, epithet.*

Introduction

The feeling of love (muhabbat) is different in the world. Love (muhabbat) is a priceless, tender feeling, it stirs up divine feelings between two people, and makes the bond stronger. Love (muhabbat) for the right reason should be preserved, guarded, nurtured carefully and felt from the heart. Love (muhabbat) causes changes in the body and activates the senses [1; p. 95].

Some people think that, love (muhabbat) is an emotion that has lost control of rationality and action. Not being able to collect feelings of love (muhabbat) will have a negative impact on a healthy lifestyle and will be associated with creating a negative state, self-control will be lost. In other words, health stops thinking. However, other people think, love (muhabbat) is Muhabbat, care, appreciation, respect and wish for good, so it will create a situation that gives an opportunity for conscious thinking [6].

The concept is defined by the materiality, and it is connected with a number of linguistic functions, it is the meaning of building the appropriate lexical-semantic paradigm; ethnic-material diversity of common knowledge.

Consequently, the novel "Terbenbes" by Qipshaqbay Matmuratov, a famous playwright, journalist and writer, an artist who served the Republic of Karakalpakstan, was widely used in the semantic discussion of the concept of 'Muhabbat' (love).

Materials and methods

In the novel "Terbenbes", the concept of 'Muhabbat' (love) is represented by various stylistic devices, such as metaphors, similes, personifications, synonyms, antithesis, hyperbole, epithets, and delivered through semantic units, such as word forms, phraseological units, sentences, etc.

One of the stylistic devices – **trope** was used in the production of concept 'Muhabbat' (love) in the novel "Terbenbes".

The trope is a stylistic term that describes the semantic changes of the word, the various parts of its semantic composition. Tropes are metaphorical phrases that can be individual words and give the expressiveness that needed. [5]. Tropes include simile, metaphor, epithet, hyperbole, and other stylistic devices [4].

Metaphor is a type of tropism, a figurative expression of a metaphor; the word system of characterizing one event by passing it on to another phrase (due to the fact that the events may or may not be similar), has its place. Metaphors fulfill the role of the tools of creating a given image, but in a clear analysis, the place, meaning, structure, and method of the metaphor can be determined.

Antithesis is a stylistic figure that expresses the dissimilarity of phenomenon.

Hyperbole is a kind of trope, that consists of the variations of things, and the exaggeration of the lines.

Comparison is one of the most used methods, and associativeness encourages imaginative thinking and allows the writer to achieve the desired effect.

Allusion is a stylistic figure that uses a clear sign in the culture of the text, which is connected to literature, historical, mythological, or a political truth.

An epithet is a figurative way of conveying the meaning of an object or fact.

Personification is the transformation of an object, a natural phenomenon or a social structure into a human variation.

We can see the main tools of language representation of the concept ‘Muhabbat’ (love) in the novel “Terbenbes” through the following examples [3]:

1. Metaphor (*Jıraw **tap jin urǵanday** birden julqındı. “Bunı óshirmew kerek, sóndirmew kerek!”*).

2. Simile (*jigittiń láblerinen **súliktey** sordı.*).

3. Personification (*qız jigit qushaǵında **talday mayısıp***).

4. Hyperbole (*Biri-birin aymalasıp, biri-birin sorısıp, biri-birine talday esilip, **ólip baratır, emeshesi qurıp baratır!***).

5. Anaphora (***Biri-birin** aymalasıp, **biri-birin** sorısıp, **biri-birine** talday esilip*).

6. Gradation (*Bul ushqın **tutansın, jansın, lawlasın, jalın pútkil álemge jıllılıq bersin!***)

A number of typological and stylistic devices are used by the author to capture the emotions of concept ‘Muhabbat’ (love), and to describe the emotional struggle of the character.

Research and Study

During the investigation we defined 3 semantic units of concept ‘Muhabbat’ (love) in the novel “Terbenbes”, as follows [3]:

1) Unlike word forms, lexemes are characterized by their relation to the speech style related to literature. The **lexemes** are more appropriate for the lexical composition of the novel that can be read as follows:

Ushqın - **flash**, jalın - **light**, quwatım - **sweety**, shıraǵım - **My dear**, intıǵıw - **to wait**, mehir-muhabbat - **affection, love**, quwanış - **gladness**, qálb - **soul**, júrek - **heart**, payandoz - **sacrifice**, paqır - **poor**, aynalayın - **My love**, qanatım - **darling**, ǵamxorım - **My hero**, intizarlıq - **anticipation**, emirenisti - **affection** [3].

2) **Phraseological units** (phrases) are phrases that have a complete meaning [12]:

perzentlik mehir-muhabbat penen – *with child’s love*;

ushqın tutansın, jansın, lawlasın – *let flash becomes fire of love*;

mańlayınan shorpıdatıp súyip atır, súyip atır – *kissed his forehead*;

súyisip sálemlesti – *greeted kissing each other*;

lıqqa tolǵan kóz jasların súrtip atır... – *rubbed eyes full of tears ...*

ózine intıǵıp-aq turǵan sulıw qızdıń – *looking forward to him beauty*;

kózi menen súyip – *kissed with eyes*;

bir-birewge intizarlıq – *anticipation to each other*;

qushaǵın ashtı – *opened his arms*;

talday mayısıp – *fell like a willow*;

qushaǵınan zorǵa sıtılp shıǵıp ketti – *barely escaped from the embrace*;

qálbi sıǵılıp ketti – *his heart sank*;

súliktey sordı – *sucked on*;

Biri-birin aymalasıp – *caressing each other*;

ólip baratır, emeshesi qurıp baratır – *he is dying, his body is drying up*;

kózler jaslanıp, emirenisti – *the eyes teared up and cried*;

júreklerine shoq salıp – *burn their hearts, set on fire*;

júrek hámiri – *dough of the heart* [3].

3) Sentences characterize the thesis [3]:

- **Jaqsı kóriw** basqa, **súyiw** basqa. Yaq, endi ol gáptiń qájeti joq. – *To love is one thing, love is another. Yes, now there is no need to talk.*

Jigittiń **kewli algaw-dalgaw**, qızdıń ózin sonsha **súyetuǵına** tańlanıp, **júregi sıǵılıp** ketti. - *The boy's heart sank because of the girl's love for him.*

Biri-birin **aymalasıp**, biri-birin **sorısıp**, biri-birine **talday esilip**, **ólip baratır**, **emeshesi qurıp baratır!** - *They caressing each other, they kiss each other, they love each other like willows, they die, and the other one dries up!*

qız jigiti **qushaǵında talday** mayısıp - *the girl fell like a willow in the boy's arms;*

qushaǵınan zorga sıtılıp shıǵıp ketti - *barely escaped from the embrace;*

jigittiń **láblerinen súliktey sordı** - *sucked on the young man's lips;*

kózler jaslanıp, **emirenisti** - *The eyes teared up and cried;*

júreklerine **shoq salıp kúydirer edi, órter edi** - *burn their hearts and set them on fire;*

Muhabbat bul **júrek hámiri** - *Love is the dough of the heart;*

Eki láb tabıstı. - *Both lips met.*

Lepes ózine **intıǵıp-aq** turgan sulıw qızdıń, barlıq sulıw jerlerinen kózi menen **suyıp.** - *Lepes kissed the beautiful body of a beautiful girl with his eyes who was waiting for him.*

Uzaq súyispek hám bir-birewge **intizarlıq aymalaspaqlardan** keyin, qız burımın tislep, kátte **ishkınp jattı...** - *After a long kiss and love, the girl fell to bed waiting...*

Qız ashıwlı **qushaqq**a endi de, jigitke **láblerin** tostı. **Lábler óbilip**, tiller **sorılıp**, qız jigiti **qushaǵında talday** mayısıp atırǵanda - *The girl fell into a fierce embrace and kissed the boy's lips. When lips are kissed, tongues are sucked, and the girl falls like willow in the boy's arms*

Jigit **ózin basalmay, qaltıraqlap** birazǵa deyin kátte otırıp qaldı - *The young man could not suppress himself and sat on the bed for a while, trembling...*

“Usı aq bilekler **meniki bolsa** eken” dep júrgen jigitterdiń **júreklerine shoq salıp kúydirer edi, órter edi!** - *Those young men who walked around saying "I wish these white wrists were mine" would set fire to their hearts and die!* [3] (word by word translation).

These types of studies allow us to come to the conclusion that the ‘concept’ is a term that serves to explain the structure of information that provides both human knowledge and experience.

Discussion

The concept is a term that often successfully used in cognitive linguistics and linguoculturology. The concept has limited meaning, but it is not only shaped by it, but it also takes into account the exact content of the word: denotative and connotative, knowledge about the event behind the word, the cultural knowledge of the ideas in various associative connections. It consists the meanings of various lexical units [10].

The concept is the identification of the events of this society, which determines what content is included in the lexical unit relevant to the culture of a special national-material society [9].

The displayed images become a distinctive sign of a person's work in any situation. The meaning of concept ‘Muhabbat’ (love) is very common in every language.

The most obvious meaning of the term "discourse" is the act of speech, "use of language". From the point of view of communicative attitude, it is possible to distinguish the conflict type of speech. Conflict speech is a type of interactive (dialogue) speech and is characterized by the implementation of anti-etiquette goals that lead to the resolution of the relations of all communication participants that are against the effective focus of communication.

The artistic text is one of the types of art that can be distinguished from the artistic method of speaking. The artistic method is a functional way of speaking, in which the text affects the reader's imagination and feelings, conveys the author's thoughts and feelings, uses the various types of vocabulary, the possibilities of different methods, is characterized by imagery and emotionality. The artistic method involves the selection of language tools in advance; all language tools are used to create a picture.

Muhabbat (Love) can be explained by both pleasant and unpleasant feelings, and it has a wide range of lexical definitions, so the semantics of the language is very interesting [8]. The classification of language phenomena in the characteristics is very effective, because it helps to develop a systematic way of language. The meaning of the concept has been explained by different researchers differently. However, this language does not interfere with our analysis of complex events in terms of various theories [11].

The lexical-semantic system is a hierarchy of semantic parts connected to the broad aspects of the word, while the other part includes smaller and significantly visible microfields.

In modern linguistics, the term "semantic field" is used to describe a complex of language units combined with some kind of integral semantic changes; In other words, it has a wireless price component.

The field, a complex of meanings belonging to one semantic component is formed, together with the number, and the semantic components of other parts of speech. It is possible to combine all kinds of linguistic tools in the composition of the language according to the levels of different grammatical classes of the language. The units that make up the field are semantically related.

Conclusion

Within the framework of our scientific work, the theoretical frameworks of concepts in the linguistic picture of the world were studied, the lexical-semantic aspect of the concept 'Muhabbat' (love) in the Karakalpak language in the novel "Terbenbes" was studied, and its lexical-semantic properties were analyzed.

Based on the stylistic analysis of concept 'Muhabbat' (love) in the novel "Terbenbes", we can make the following conclusions:

1. In the novel "Terbenbes" by Karakalpak writer Q. Matmurotov, the central place is not only occupied by the concept of 'Muhabbat' (love), but it is based on historical facts and depicts scientists who tried to preserve the unity of the people, rich people who showed kindness to the hungry people, and other characters.

2. This concept contains a lot of sensitive content, that is: *sadness, joy, happiness* and others.

3. The lexical components of the concept are divided into thematic groups such as "Love is a supreme feeling", "Mother/Father's love", "Love is a command of the heart".

4. The concept 'Muhabbat' (love) is a complex semantic structure, represented by various semantic units [3]: "*Lábler súyisiwi*" (kissing lips), "*Jaqsı kóriw*" (to love), "*Júregi sıgılıw*" (heart sank), "*Bir-birin aymalaw*" (caressing each other), "*Talday esiliw*" (like a willow), "*Emeshesi qurıw*" (drying up), "*Júreklerine shoq salıw, órtew*" (burn hearts, set a fire), "*Muhabbat – júrek hámiri*" (Love is a dough of heart), "*Ómirlik qostar*" (lifelong spouse), "*Júrekler sháwkiildep quwandı*" (happiness) etc.

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Rezyume: *Ushbu maqolada qoraqalpoq adibi Qipshaqboy Matmurotovning “Terbenbes” romanidagi uslubiy vositalar, leksema va frazeologik birliklar orqali tahlil qilingan “Muhabbat” (love) tushunchasi bilan bir qatorda bosh qahramon Lepes bayning hayoti, muhabbati, qaygʻulari tasvirlangan.*

Резюме: *В данной статье описывается жизнь, любовь, горести главного героя Лепес бая, а также концепт «Муҳаббат» (love), переданный через стилистические приемы, лексемы и фразеологизмы в романе «Тербенбес» каракалпакского писателя Кытшақбая Матмуратова.*

Kalit soʻzlar: *“Muhabbat” tushunchasi, leksik-semantik, frazeologik birliklar, leksema, soʻz tartibi, metafora, troplar, giperbola, epitet.*

Ключевые слова: *Концепт «Муҳаббат» (love), лексико-семантические, фразеологические единицы, лексема, порядок слов, метафора, тропы, гипербола, эпитет.*

MODALITY IN KARAKALPAK LANGUAGE

Khudaybergenova Z.O.

Karakalpak state university named after Berdakh

Summary: *This article deals with the modal words in Karakalpak language and some forms of modal words are illustrated with the examples taken from the literary text. Modal words are divided into two groups according to their use in speech and their connection with other parts of speech like individual and component modal words while due to the construction of modal words, they can be divided into basic and functional modal words. Modal words in Karakalpak language is supposed to be a broad concept since it can be derived from various part of speech.*

Key words: *modality, probability, certainty, obligation, part of speech, morphologically, syntactically*

Modal verbs are used to show the speaker's attitude toward the action or state indicated by the infinitive, i. e. they show that the action indicated by the infinitive is considered as possible, impossible, probable, improbable, obligatory, necessary, advisable, doubtful or uncertain, etc.[1: 119]

Modality in Karakalpak language is a grammatical category that expresses various relations to the opinion of the speaker and its content. The concept of modality indicates probability, certainty of the expressed opinion, whether it is real or unreal, whether it is confirmed or rejected, and whether it is true or not.

It is also possible that the relation of the expressed opinion to the truth does not depend on the speaker, and such a relation is called **objective modality**. Objective modality is expressed in the verb tense and mood forms of the verb, and expresses **real action** (*келеди, келген еди/will come, had come*) or **unreal action, command, condition, wish** (*кел, келсе еди, келер ме еди/come, if ... came, would have come*). Sometimes, the speaker may express their subjectivity relation to the expressed opinion, and such relation is called **subjective modality**. For example, in the sentence “*Ол келеди/He will come*”, the speaker does not affect the expressed opinion, that is, there is no subjective modality. However, if the sentence “*Ол, албетте, келеди/He will certainly come*” expresses the speaker's subjective relation, his belief. Subjective modality denotes the concepts such as **certainty, assurance, confirmation, approximation, prediction, expressive assessment, obligation**. Such meanings are expressed in the language by special intonation, order of words, moods of verbs, affixes, suffixes.

Among the language means mentioned above the expression of subjective modality, especially special words and word phrases that come from other part of speech plays an essential role in expressing the meaning of modality in Karakalpak language and these are considered to be modal words.

Modal words began to be considered one form of a part of speech in the 40s and 50s. For the first time, in the Russian linguistics academician V.V.Vinogradov recognized and analyzed modal words as a separate part of speech, and N.K. Dmitriev separated modal words from other words for the first time in Turkology and considered them as a central word between meaningful and particles.

For the first time, N.A. Baskakov showed the modal words in the Karakalpak language and considered them to be a part of speech together with particles [2: 214].

In the late 1950s and early 1960s, modal words were used in school lessons, and the terms “neutral words” was mentioned. In the later period, modal words began to be considered as a part of speech in the works written on morphology.

Formation of modal words as a part of speech their semantics serves as a special sign.

Certain words change their original lexical meanings in speech and are used in various modal (certainty of opinion, reliability, uncertainty, prediction) meanings, therefore they become modal words. For example:

a) — Демек, районда диспансеризация **дурыс** өткерилмеген.[3: 25]

b) — Қантлы диабет емленбейди-го, — дедим мен.

— **Дурыс**, емленбейди. Лекин, алдын алыўға, сақланыўға болады го! (М. Нызанов, 25)

Translation:

a) — So, dispensation was not carried out **properly** in the district.

b) — Diabetes cannot be treated, — I said.

— That's **right**, it's not treated. However, it is possible to prevent and take care!

In the first example, the word “**дурыс/properly**” is used in its proper meaning, while in the second example “**дурыс/right**”, it is used in the modal meaning, expressing the reliability of the speaker. In this case, the indicated words appear at the beginning of the sentence, or in other positions, and take on the function of parentheses, and serves as an introductory part of the sentence.

Morphologically, modal words belong to the group of words that do not change. They have a certain form of modal meaning from different part of speech, and in this sense they are not divided into different morphemes and do not accept word-changing affixes.

Syntactically, modal words are related to one part of the sentence and express the subjective value of the expressed opinion. Some of them (**бәлким, әлбетте, менинше, мысалы/perhaps, certainly, in my opinion, for example**) are not used with other part of speech together, but they can be combined only from the point of meaning. However, some modal words are used only in the compound predicate. For example:

Оксананың қайсы есикке кирип кеткенин абайламай да қалдым — туўыў үйине ме, балалар бөлиmine ме, қулласы, усы еки бөлимнен жырақ **кетпесе керек**. (М. Нызанов, 16)

Translation:

I didn't even pay attention to which door Oksana entered - whether it was the maternity ward or the children's department, in fact, it **should not be far** from the two parts.

The indicated differences are considered to be the distinguishing features of modal words from other part of speech. Thus, modal words express the relationship of subjectivity and objectivity from the point of view of “possibility, necessity, obligation” to the clarity of the speaker in nature and society, to the clarity of the phenomena and connections, together with all their important meanings.

In Karakalpak language modal words are divided into two groups according to their use in speech and their connection with other parts of speech: **individual modal words** and **component modal words**.

Modal words with individual meaning are used separately in the speech, and according to the lexical meaning, they express the speaker's relationship to the expressed opinion and serve as a parentheses in the sentence. That's why some researchers call such modal words as a parentheses words. Individual modal words mean the modality related to speech and opinion. For example:

a) **Ҳақыйқатында да**, биз гейде өзимиз бир аўырыў ҳаққында көп ойласақ, сол аўырыўды шақырып алыўымыз мүмкин. (М. Нызанов, 67)

b) — **Бәлким**, бир районларға қайта барыўыма туўра келип қалар. (М.Нызанов, 73)

c) **Дурыс**, клопелин қан басымды тез түсиреди. (М. Нызанов, 72)

d) **Мүмкин**, бүгин нәўбетшиликте турған шығар. (М. Нызанов, 134)

Translation:

a) **In fact**, if we ourselves think too much about a decease, we may be the cause for appearing that decease.

b) - **Maybe**, I will come back to some regions.

c) *That's right*, clopelin quickly lowers blood pressure.

d) *Maybe*, he was on duty today.

Modal words include not only individual words, but also word chains with modality meaning, and even sentences, because their functions are the same as those of individual modal words. For example:

a) *Тилекке қарсы*, ол лётчик болмай шықты. (М. Нызанов, 51)

b) *Анығын айтқанда*, өзинің усы киятырысы да еп-ерси сезилди (Ө. Хожаниязов).

c) *Өз перзентим болса да шынын айтайын*, Сергей атасына усаған — қатал хәм мийримсизлеу. (М. Нызанов, 51)

d) *Ким билсин*, жастан мийнет көрмей сада өскен бала шығар (К.Султанов).

Translation:

a) *Unfortunately*, he did not become a pilot.

b) *To be honest*, he felt his behavior very stupid as well/

c) *Telling the truth*, even if it's my own child, Sergei was strict and unforgiving to his grandfather.

d) *Who knows*, maybe he is a child who grew up without difficulties from his youth.

Component modal words are not used individually, they appear only as one of the components of a compound predicate and express the relationship of the speaker to the expressed opinion, and therefore such modal words are called component modal words. For example:

a) *Өз анасы қандай болса, өмирлик жолдасының анасы да сондай болыұы тийис* [4: 114].

b) *Неде болса анасын таұып алыұы керек*. (Т.Кайнбергенов, 139)

c) *Дурыс жууап беруіи лазым*. (Т.Кайнбергенов, 278)

Translation:

a) A wife's mother *should be* like her own mother.

b) At least he *should find* his mother.

c) He *must answer* correctly.

According to the construction of modal words in Karakalpak language, they are divided into basic modal words and functional modal words. Basic modal words include the words that have changed their original lexical meaning and are currently used only in a modal meaning. They are not divided into morphemes: *әлбетте*, *бәлким*, *мүмкин*, *итимал* (certainly, perhaps, perhaps, likely) etc. Some of the basic modal words are borrowed from Arabic and Persian languages (*әлбетте*, *бәлким*, *мүмкин*/certainly, perhaps, maybe, etc.).

Functional modal words are words that, depending on the context, are used either in their basic lexical meaning or in a modal meaning. Let's compare the examples that we mentioned above:

a) — *Демек, районда диспансеризация дурыс өткерилмеген*. (М.Нызанов, 25)

b) — *Қантлы диабет емленбейди-ғо, — дедим мен*.

— *Дурыс*, емленбейди. *Лекин*, алдын алыұға, сақланыұға болады ғо! (М. Нызанов, 25)

Translation:

a) — So, dispensation was not carried out *properly* in the district.

b) — Diabetes cannot be treated, — I said.

— *That's right*, it's not treated. However, it is possible to prevent and take care!

The word “*Дурыс/propely*” in the first example is used in the meaning of adverb, while the word “*Дурыс/ right*” in the second example means the meaning of modality that supports the speaker's opinion.

Formation of functional modal words is different. Both nouns and verbs of a certain form can be used for modal words [5: 411]:

а) **Nouns:** ҳақыйқатында, ақыры, мысал-ы, шама-сы, тийкар-ы-нда, нәтийже-де/in fact, in the end, for example, approximatly, in the conclusion, in the result, etc.

б) **Adjectives:** дурыс, сөзсиз, ырас, шубҳасыз, туўры/correct, unquestionable, true, unquestionable, correct etc.

в) **Numerals:** бириншиден, екиншиден, биринши гезекте/firstly, secondly, from the first time and etc.

г) **Pronouns:** мениңше, сениңше/ in my opinion, you think, etc.

д) **Adverbs:** керисинше, қырсығына, ақырында, қасақана/ on the contrary, on purpose, finally etc.

е) **Verb forms:** демек, айтпақшы, айтайық, усайд екен, шығар/ so, by the way, let's say, maybe etc.

According to their structure, modal words are divided into root modal words and derived modal words.

Root modal words consist of one root and cannot be divided into other morphemes: **керек, ырас, дурыс, әлбетте, мүмкин, итимал**/must, true, right, of course, maybe, likely, etc.

Derived modal words contain both word-forming and word-changing affixes, but these affixes do not form modal words (modal words do not have special word-forming affixes). They are considered to be the form of these words before transitioning to modal meaning.

Among the modal words in the modern Karakalpak language, the word-forming affixes -сыз, -сиз (*шубҳасыз, сөзсиз*)/without doubt, without saying) are added. They created adjectives and adverbs from these words, and later these forms became modal words.

In conclusion, we would say that modal words in Karakalpak language is the category that indicates various relations to the speaker's opinion and its content as well. In other words, the modality can be expressed with the meaning of probability, certainty of the expressed opinion, if it is real or unreal, if it is confirmed or rejected, and whether it is true or not. Modal words in Karakalpak language is supposed to be a broad concept since it can be derived from various part of speech.

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Rezyume: *Ushbu maqolada qoraqalpoq tilidagi modal so'zlar haqida so'z yuritilib, modal so'zlarning ayrim shakllari badiiy matndan olingan misollar bilan ko'rsatilgan. Modal so'zlar nutqda qo'llanishi va boshqa gap bo'laklari kabi alohida va komponentli modal so'zlar bilan bog'lanishiga ko'ra ikki guruhga bo'lingan bo'lsa, modal so'zlarning yasalishiga ko'ra asosiy va funktsional modal so'zlarga bo'linadi. Qoraqalpoq tilida modal so'zlar turli gap bo'laklaridan yasalishi mumkinligi uchun keng tushuncha xisoblanadi.*

Резюме: *В данной статье рассматриваются модальные слова в каракалпакском языке, и некоторые формы модальных слов иллюстрируются примерами, взятыми из художественного текста. Модальные слова делятся на две группы в зависимости от их*

использования в речи и их связи с другими частями речи, как отдельные и составные модальные слова, а по конструкции модальных слов они могут быть разделены на основные и функциональные модальные слова. Модальные слова в каракалпакском языке считаются широким понятием, так как могут быть производными от различных частей речи.

Kalit so‘zlar: modallik, ehtimollik, aniqlik, majburiyat, gap bo‘lagi, morfologik, sintaktik.

Ключевые слова: модальность, вероятность, определенность, обязанность, часть речи, морфологически, синтаксически.

**FACTORS DETERMINING THE SUCCESS OF LISTENING TO A FOREIGN
LANGUAGE SPEECH**

Konisov G.U.

Karakalpak State University named after Berdakh

Summary: *The article presents arguments for an emphasis on listening comprehension in language learning and teaching. An explanation of how listeners can use different strategies to enhance the learning process is presented with a review of the existing research base on teaching listening in English classes.*

Key words: *perception, resourcefulness and ingenuity, subjective factors, a fixed attitude.*

The success of listening depends, on the one hand, on the listener himself (on the degree of development of speech hearing, memory, the presence of his attention, interest, etc.), on the other hand, on the conditions of perception (the rate of oral characteristics, number and form of presentation, duration of sound) and, finally, on the linguistic features - linguistic and structural-compositional complexity of the speech and their correspondence to the speech experience and knowledge of students.

It is believed that listening is associated with difficulties of some objective natural factors which are independent from the listener's skills. However, the success of listening depends on the listener's ability to use predictions using transferable skills developed in their native language to a foreign one. We should mention the great importance of such individual features of the student as their resourcefulness and ingenuity, the ability to listen and respond quickly to all units of oral communication (pauses, logical emphasis, rhetorical questions, phrases, linking verbs, etc.).[1].

These skills are developed in the process of teaching many subjects and in high school, judging by literature classes, students are mostly proficient in the culture of speech both in terms of its generation and perception. In a language high school, designed to prepare a highly qualified teacher of a foreign language, already during the introductory-corrective course should be taught the ability to listen and observe, to acquaint students with the functions and purpose of introductory questions, with the role of brief comments, with the purpose of visualization and headings.

The process of listening comprehension is characterized by an active purposeful nature associated with the performance of a complex thought-memory activity, the success of which is facilitated by a high degree of concentration of attention. Attention occurs with the help of emotions and develops through them, but human emotions are always manifested in unity with the volitional processes.

The success of listening depends, in particular, on the need of students to learn something new, to connect with the choice of future profession, on the presence of interest to the topic of the message, on the awareness of the objective need to learn, to hold certain positions (good or excellent student in the group, etc.), i.e. on the so-called "subjective factors" that contribute to the emergence of the installation for cognitive activity.[2].

Thoughtful organization of the learning process, clarity and consistency of presentation, maximum reliance on active thought activity, diversity of teaching methods, clarification of perception tasks allows you to create an internal, direct students' attention to those moments that will help program future, practical activity with the perceived material.

Depending on the goal setting that precedes listening, perception will be either passive or active. In the latter case, the listener can more quickly engage in "searching activity", successfully make hypotheses, check and correct them, and better remember the logic and sequence of the presentation.

On the nature of perception and memorization of content, a fixed attitude can have both positive and negative effects, i.e., it can make perception more accurate or erroneous if the listener, under the influence of expected, attributes to perceived phenomena non-existent features.

In this connection we could refer to two studies, the results of which confirm the influence of attitude not only on probabilistic prediction, but also on memory activity. The English psychologist D. Braque asked his students to listen and, if possible, write down a simple text accompanied by loud music, which drowned out the content. In order to make it easier for them to perceive it, the theme was "Sports". The text was then presented a second time under conditions of the same interference, but with the new theme. The experiment was repeated several times and all students, more or less successfully coped with the task, i.e. understood the texts. At the end of the class, the subjects were surprised to learn that they had perceived the same text the entire time.

In another experiment a group of teachers of English was offered to translate a meaningless sentence "The pirot karolizes elatically", constructed according to L.V. Shcherba's "glokaya kuzdra". Before the first presentation was called "From the world of birds," then the experimenter apologized for the alleged error and called the new topic "From the field of aviation". After a short pause for reflection, the subjects were asked to analyze their train of thought.

In the first case, some subjects mistook the word "The pirot" for a bird they did not know, while others thought they had misheard it; in the second case, "The pilot" was associated with the word "Pilot". In both cases, the strengthened morphological-syntactic connections helped "make sense" of the sentence.

It is difficult to perceive on hearing and to keep the sequence of the statement when setting on simultaneous performance of operations of distinction, grouping and selection. Here the factor that testifies to the limited volume in the field of attention acts.[3].

The above stated indicates the difficulty of perception in extreme conditions (in the presence of disturbances, in the wrong instruction, in the case of fatigue of students, etc.). Improvement of receptive skills is possible due to the motivational factor, which has a positive impact on students' performance and memory activity. Skillful combination in paired work of different students, various and interesting forms of control, commenting estimates with an indication of a noticeable improvement in listening perception of the group or individual students, etc. It will contribute to the activation of mental activity, increase interest in the work as well as the sense of individual and group responsibility.[4].

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Rezyume: *Maqolada chet tilini o'rganish va o'rgatish jarayonida nutqni idrok etishga e'tibor qaratish foydasiga dalillar keltirilgan. Ingliz tili darslarida tinglab tushinish bo'yicha mavjud ilmiy adabiyotlarni ko'rib chiqish bilan birgalikda o'quv jarayonini takomillashtirishning turli strategiyalari taqdim etiladi.*

Резюме: *В статье приводятся аргументы в пользу акцентирования внимания на восприятии речи в процессе изучения/преподавания иностранного языка. Различные стратегии для улучшения процесса обучения, представлено с обзором существующей исследовательской литературы по обучению с использованием аудирования на уроках английского языка.*

Kalit so'zlar: *nutqni idrok etish, topqirlik va zukkolik, sub'ektiv omillar, doimiy e'tibor*

Ключевые слова: *восприятие речи, находчивость и изобретательность, субъективные факторы, фиксированное внимание.*

UDC:371.036:17.02

**ETHICAL-AESTHETIC EDUCATION CURRENT OF STUDENTS, AXIOLOGICAL
CONSCIOUSNESS AND WORLD VIEW FORMATION OF PEDAGOGICAL
DEVELOPMENT MECHANISMS**

Asamatdinova J., Kurbanova R.

Karakalpak State University named after Berdakh

Summary: *In given article actual problems of moral and esthetical upbringing based on our national and human values are considered, the recommendations how to educate teenagers with the aim of forming a valuable orientation are given.*

Key words: *morality, esthetics, national values, education, person, activity, self-consciousness, valuable orientation.*

In social sciences, expressions such as political consciousness, ecological consciousness, and aesthetic consciousness are considered as scientific concepts recognized by many. However, the phrase axiological consciousness is unknown to many, and there are very few opinions about its content. Axiological consciousness is a special form of social consciousness, reflecting the world, reality and life based on the feeling of framing. The attitude, approach, actions and activities based on it are also different from others. For example, law reflects the legal relations of people and their activities in this regard. Legal requirements and norms have become laws or regulations and are reflected in certain documents. Compliance with them is considered mandatory in many cases, and a number of offices and organizations work in this regard. Ethics, aesthetics and axiology are different from law. Special organizations and offices that implement the rules and requirements related to them are the load calculation.

These rules and requirements are often seen as moral standards of public opinion, activity and living. There is no exact measure to determine their profit or loss. This, in particular, is the feeling of appreciation and appreciation [5; 123]. Social values are visible in their relationship with society, which is directly related to the life experience and socially formed ideas of a person. That is why values are closely related to the knowledge that forms a person's worldview and attitude to the object. If the young generation does not have enough information about life processes or does not have knowledge about the aspects that are valued and should be implemented in it, they cannot express an opinion about life values. For this, of course, there must be life experience, knowledge and ideas.

If the main values are visible in the promising goals of the young generation in life, what they are striving for now and what they are striving for in the future, the intermediate values serve as a means to realize these goals [8;57].

Currently, attention is paid to the educational process as a factor of personal socialization that helps in the formation of the value system. In particular, in the process of moral-aesthetic education, the formation of axiological consciousness and worldview of students is of great importance. This, in turn, requires students to be oriented towards personal values.

Based on the results of the analysis, according to the essence of moral education, the human mind is related to society, it is responsible to society, it understands that its behavior is dependent on the level of development of society, it feels responsibility to fulfill the moral norms, ideals and requirements recognized by society, and spiritual and moral knowledge is converted into beliefs. and it was concluded that the systematicity of these beliefs, the formation of strong spiritual and moral feelings and characters, the understanding that spiritual and moral behavior by students is one

of the criteria that show respect for the members of society, and the formation of spiritual and moral habits[1; 125].

Aesthetic education is a systematic process aimed at the development of personal abilities aimed at the full perception and correct understanding of beauty in existence and art, it reflects the system of artistic experiences, views and beliefs, and ensures the enjoyment of true aesthetic values.

In turn, moral and aesthetic education are interrelated, and the world of sophistication operates without being separated from goodness and kindness, impartiality.

Based on this basis, the research concludes that moral-aesthetic education is a systematic pedagogical process aimed at equipping students with standards of morality and sophistication, forming moral-aesthetic consciousness, behavior and habits in them, and shaping the competence of demonstrating moral-aesthetic values in the implementation of activities.

The analysis of philosophical and pedagogical-psychological literature showed that there are different approaches to the interpretation of the concept of "value". From a philosophical point of view, value is perceived as a widespread subjective image or imagination that is evaluated by a person; in the sociological approach, value is interpreted in a strong connection with the social norms that form a person's life activity, his behavior; psychology expresses this concept in connection with the interests and needs of a person. In pedagogy, the concept of "value" reflects a person's personal attitude to the world, based on his or her individual life experience and knowledge about the world, which is aimed at the all-round harmonious development.

In the scientific literature, one can find various definitions of the concept of "value", "value orientation", "value orientation", "value system".

If value is considered separately from the form of social consciousness such as religion, ideology, art, then doubts arise regarding its independent meaning. Because the satisfaction of any needs of a person or society reflects not only the material, but also the relationship with the ideal [5;27]. The need itself determines a number of conditions and characteristics of social life. Therefore, value is a result of the harmony of the attitude of man and society to the external world, their internal needs and their relationship to reality. The formation of a stable character of this relationship is expressed by the term "valuable orientation", which serves to shape the purpose and motives of human activity[6;42].

The term "value orientation" of a person was introduced into the field of sociology in the 20s of the 20th century by U. Thomas and F. Znanetskyi. According to them, social attitude is a process of individual understanding that determines the real and daily activity of an individual in the social world. In other words, the social institution performs the "core" task of managing the behavior of an individual, group, and society as a whole. Before the emergence of a social institution, an individual's understanding of the needs and conditions takes place. The influence of the society is determined by achieving the satisfaction of the needs based on the acquisition of certain information by the society. Thus, orientation to value is formed in the mind of the individual, is determined and changes[4;28].

In the work of T. Parsons called "On the formation of a social movement", the relationship between the concepts of value and value orientation is separately shown. That is, the functional needs of the society appear based on the visibility of the striving for standards in the social culture.

Value orientation also reflects the individual's life experiences and aspirations. Orientation to this value has its own psychological characteristics, and due to the nature of the personality, it reflects all its components and the overall system. In turn, a person's orientation to value gives an opportunity to have an axiological attitude. Although many authors use the concepts of "value orientation" and "value orientation" as synonyms, M. Rokich was the first to distinguish the difference between them. According to the American scientist, an attitude can be considered as a set of beliefs and beliefs formed over a long period of time, reflected in the subject's attitude towards a certain object (concrete or abstract, personal or social) or situation. So, if orientation is reflected in a

person's harmony with the norms of society and human needs, then a valuable attitude is reflected in a person's readiness to realize this system of relations in practical activities. According to B. Khojayev, a scientist who conducted researches in the field of pedagogical axiology, the understanding of a person's internal position and readiness for practical activities in connection with certain values determine the essence of a valuable attitude.

The setting appears as a set of cognitive (knowledge, information) and affective (emotion, feeling) components that reflect a person's readiness for specific activities [7; 17].

Based on the analysis of studies on the development of value orientation, its following components were determined: goal orientation (what is planned to be achieved?); on motivational activity (increasing the individual's activity); emotional-volitional (attitude and self-reflection of an individual directed to achieve a set goal); reflexive-evaluator (personal assessment of one's actions) (Table 1).

Components of development of value orientation in students

Computers	Description	criteria
Goal orientation	Understand of life purpose and meaning of life	Social significance of activity
On motivational activity	Increase moral aesthetic activity of the person	Activity orientation
Emotional voluntary	Self- relation and self-expression of a person directed at achieving a set goal	Manifestation of emotion and will
Reflektive evaluator	Personal assessment of one's own behavior	Sell- assessment

As a result of the analysis, it was concluded that the value orientation is closely related to the social relations of the terminal and instrumental value systems. Terminal (goal-oriented) values serve to describe the things-events that are important for a person, and instrumental (means) values serve to describe the manner of actions that show how to move in life situations[2; 78].

Based on the results of the research, it was determined that value orientation reflects the system of terminal and instrumental values. In particular, the terminal values of development of value orientation in students are concrete life and abstract, personal, professional orientation, individual and interpersonal relationship; It was determined that instrumental values are visible in moral-aesthetic, communicative, individual, conformist, altruistic, and intellectual forms.

Therefore, man is the supreme miracle of nature, the social product of historical development and the main value of society. The social justice of any society depends on the implementation of the standards of universality in it, the final result, the level of human dignity, and the creation of opportunities for a person to show his individual values. Every person is valuable for others and society as a result of their values and their manifestation in different forms. Man is responsible not only for the world of values, but also for his own value and its visibility[3;56]. This responsibility, in turn, is one of the main criteria that shape its value. He learns how to get high. This means the personal process of forming an axiological attitude in this person.

The results of the research show that axiological attitude is not only an event related to a single individual, but it can also be related to a social group, class, nation, state, society. In this sense, it is possible to establish individual and social visibility levels, separate, private and general forms of axiological approach and valuable attitude.

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Rezyume: maqolada yoshlarni tarbiyalashning mazmuni, texnologiyasi, metodlari va metodologiyasiga yangicha yondashuv haqida so'z yuritilib, shaxsning yuksak qadriyatini shakllantirishga qaratilgan tarbiyaning nazariy va amaliy asoslari kursatilgan.

Резюме: данной статье рассматривает актуальную проблему в воспитаний молодежи, как познание себя, образование феномены познание человека и в свою очередь проведение в учебных заведениях, в школах внеклассные уроки по воспитанию эстетических и нравственных качеств у обучающихся.

Kalit so'zlar: axloq, madaniyat, nafosat, psixologiya, o'z-o'zini tarbiyalash, o'zligini anglash, milliy qadriyat, xulq-atvor, komil inson, shaxs.

Ключевые слова: нравственность, эстетика, национальные ценности, воспитание, личность, деятельность, самопознание, ценностная ориентация.

INNOVATIVE TECHNOLOGIES IN ROAD CONSTRUCTION

Seytnazarova D. X.

Karakalpak State University named after Berdakh

Summary: *The article considers the key areas of using innovative methods of road construction; researched innovative technologies used in the construction of roads in Uzbekistan; examples of innovative roadway materials are given; promising projects of foreign and Russian researchers were compared; a comparative analysis of the accumulated value during the operation of the roadway was carried out; methods have been developed to improve productivity in road construction.*

Key words: *road design, road surface, innovative materials, method, technology.*

INTRODUCTION

Everyone knows and understands that without the development of the country's transport system it is impossible to build an effective market economy.

Every year the intensity on the roads is increasing. Consequently, the load on the road surface also increases. In order to increase the service life and quality of the highway, one has to look for new building materials and construction methods.

Innovations in road construction allow the use of better and more environmentally friendly materials for construction, such as the reuse of recycled materials.

World experience shows that the formation and development of transport infrastructure is often a catalyst for the development of other sectors of the economy and entire regions. In the context of budgetary constraints in Uzbekistan, the implementation of the tasks of the state to maintain and expand the road network is often focused on minimizing the cost of work at the stage of direct construction, which does not correspond to the approach of developed countries based on managing the cost and costs of operating the road as the final asset throughout the entire life cycle. This vector is confirmed by the development of modern innovative technologies in the field of road construction.

MATERIALS AND METHODS

The specifics of the studied area and its importance in the national economic complex allows us to determine the following main areas of innovative technologies (Figure 1).

Let's consider these directions in more detail.

Examples of innovative materials in road construction include drainage asphalt, porous mastic asphalt mixes, colored asphalt mixes, modified bitumens, polymer-bitumen binders made from thermoplastics, etc.

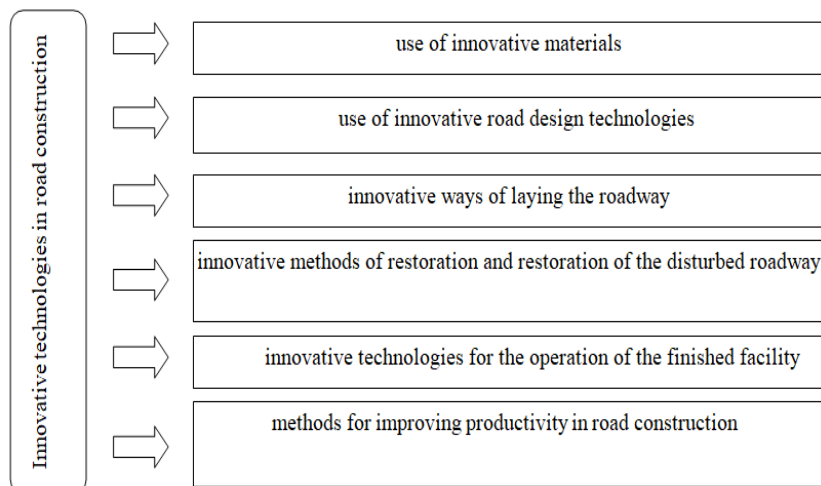


Figure 1. Key directions of using innovative technologies in road construction

RESULTS AND DISCUSSION

In Uzbekistan, the use of innovative materials in road construction is hampered by the lack of incentives and motives for contractors. However, from the point of view of the theory of the life cycle of a road as a final object, an asset, the costs of its subsequent maintenance and operation can many times exceed the savings at the construction stage. Thus, cement concrete pavement is more expensive than asphalt pavement by an average of 70-80%, while asphalt roads need to be repaired after 3-4 years of operation, while cement concrete roads during the first 10-12 years practically do not require expenses for repair.

The cost of design work usually forms 3-5% of the cost of contract contracts, while it is the savings in design costs, which is reflected in the quality and sophistication of design solutions, that most often is the source of contract price reduction⁴. Examples of modern software products for road design are AutoCAD Civil 3D (USA), CARD/1 (Germany), GIP (Russia), ROBUR (Russia).

Modern innovative methods of laying the roadway include the high-temperature pressing method, as well as a set of innovative methods for strengthening the soil, including the use of polystyrene foam boards as the basis of the roadway, soil stabilizers with a cementing catalytic-binding effect, geogrids and geotextile.

Innovative methods of repair and restoration of the roadway include the technology of cast asphalt concrete mixtures, infrared repair, hydrophobization, the use of nanophobes to restore the destroyed roadbed, and the method of chemical milling of irregularities.

The listed innovative technologies are often used in combination in the implementation of innovative projects in the field of road construction. In Uzbekistan, a system is being formed to inform stakeholders about innovations in the industry. Thus, Uzavtoyul compiles a list of progressive materials, new technologies and equipment in a special regularly updated section on the official website, publishes a catalog of innovations in the road industry in Uzbekistan once a year.

Foreign researchers offer promising innovative technologies that are focused on environmental friendliness and reducing environmental damage during the construction and operation of roads. For example, in the Future of High-Speed Rail report, the company

"ARUP" considers such promising technologies as "self-healing" concrete containing bacteria that can restore the integrity of the canvas with small cracks, a road with a solar panel base that can remotely charge electric vehicles moving along it.

The European company Heijmans describes the development of Dutch scientists as part of the Smart Road project, which involves the application of road markings with photoluminescent materials that are susceptible to temperature changes. In frosty weather, snowflake-shaped symbols appear on the road with such markings, warning the driver of icing. A similar material for applying road markings that glow at night is used in the pilot project of Rosnano "Innovative Road", which is intended for implementation in the Tashkent and Samarkand regions [2].

Thus, the emphasis on optimizing costs at the stage of road construction does not correspond to the best international practices, since one of the vectors for the development of the industry is the targeted optimization of the cost of the final asset throughout the entire life cycle. An analysis of modern innovations in road construction in different countries showed that modern technologies and materials are focused on extending the life of the road surface, minimizing the cost of maintaining it in good condition for a long time, and reducing environmental costs. The reason that hinders work in this direction and hinders the introduction of innovations in the road industry in Uzbekistan may be a conflict of interest between the contractor, the customer of the project and the owner of the road as the final asset due to a compromise between the initial investment and the subsequent costs of maintaining the final asset throughout its life cycle.

To correct the situation, the state should stimulate and develop investment in road construction projects with improved long-term life cycles, taking into account not only the initial

design and construction costs, but also long-term costs in the future (expenses for road repair and operation, installation of fences, carrying road markings).

Innovative technologies in road construction include the following areas [3]:

- Use of innovative materials;
- Use of automated technologies for designing roads;
- Methods for increasing productivity in road construction;
- Use of innovative types of coating;
- Use of innovative ways to combat the formation of cracks and potholes in the road surface.

Consider some types of innovative technologies [4]:

1. Strengthening weak soils with crushed stone piles

When crushed stone piles are installed, the strength characteristics of the soil mass increase, where reinforcement is performed, as a result of which its bearing capacity and stability increase. This method makes it possible to reduce the base deformation value from 2 to 6 times. Also, the method allows to reduce the construction period and reduce the cost of the road, by saving on fuel for construction equipment.

2. Use of automated design technologies

Currently, the design of roads is carried out with a wide use of automated procedures, ranging from the collection and processing of geodetic information to the preparation of drawings and cost estimates. Design automation occupies a special place among information technologies. With the help of programs such as Credo, you can create a complete road project.

3. Low noise asphalt

This type of asphalt concrete pavement is divided into:

- Fine-grained surfaces;
- porous coatings;
- Rubberized asphalt.

Fine-grained surfaces are ordinary asphalt concrete surfaces that are mainly composed of fine-grained particles.

Porous coatings are coatings that have open pores so that water and air can freely escape.

Rubberized asphalt is asphalt, which includes crumb rubber obtained by processing used car tires. It provides additional ductility to the pavement, which gives air more time to escape from the pores at lower pressures as the tires pass over it.

The disadvantage of low-noise asphalt is the price. The preparation and installation of such asphalt can be much more expensive than conventional solutions.

4. Introduction of new building materials with new chemical properties.

This technology makes it possible to soften asphalt concrete and make it more elastic in conditions of negative temperatures by adding polymer additives to bitumen. This will lead to softening of asphalt concrete by 2-2.5 times. These developments allow you to deal with the formation of cracks and potholes. The given examples of technologies are only a small part of a large number of developments that in the future can change the idea of roads and the technology of its construction.

CONCLUSION

In conclusion, it can be said that the use of innovative technologies in road construction leads to getting rid of unnecessary costs. In addition, the quick completion of construction is guaranteed. Deep assimilation and implementation of innovative technologies is the main task of the road sector of our country today.

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Rezyume: Maqolada yo'l qurilishining innovatsion usullaridan foydalanishning asosiy yo'nalishlari ko'rib chiqilmoqda; O'zbekistonda yo'llar qurishda foydalanilayotgan innovatsion texnologiyalarni tadqiqladi; yo'l polotnasining innovatsion materiallari misollari keltirildi; xorijiy va Rossiya tadqiqotchilarining istiqbolli loyihalari solishtirildi; yo'l polotnasidan foydalanishda to'plangan ahamiyatga nisbatan tahlil qilindi; yo'l qurilishi unumdorligini oshirish usullari ishlab chiqildi.

Резюме: В статье рассматриваются ключевые направления использования инновационных методов дорожного строительства; исследовал инновационные технологии, используемые при строительстве дорог в Узбекистане; приведены примеры инновационных материалов дорожного полотна; сравнивались перспективные проекты зарубежных и российских исследователей; проведен сравнительный анализ накопленного значения при эксплуатации дорожного полотна; разработаны методы повышения производительности дорожного строительства.

Kalit so'zlar: Yo'llarni loyihalashtirish, yo'l qoplamasi, innovatsion materiallar, usul, texnologiya.

Ключевые слова: проектирование дорог, дорожное покрытие, инновационные материалы, метод, технология.

FROM THE HISTORY OF THE NOMADIC UZBEKS (THOUGHTS AND HYPOTHESES)

Utebaev M.¹, Mawlenov I. M.²

¹*Karakalpak Institute of Humanities and Sciences,*

²*Karakalpak State University named after Berdakh.*

Summary: *The article talks about the place and development of the Uzbek people in Central Asia, the history of ethnic development.*

Information about the emergence of the Uzbek-Khanlyg country or the country of rural Uzbeks, the type of khans that founded it.

Key words: *Sheybaniy Uzbek, Altin Orda, polytonym, Abilkhayir khan, ethnic union, ethnic origin.*

Today, the Uzbek nation is the largest nation in Central Asia, and its origin and ethnic development is a very difficult and controversial problem in history. When we say Uzbek, we understand the main population of Uzbekistan today, besides the Uzbeks, there are a large number of Uzbek ethnic groups and nationalities in neighboring countries such as Turkmenistan, Kazakhstan, Tajikistan, Kyrgyzstan, and Afghanistan.

It is not a secret that today's Uzbeks themselves are made up of various ethnic groups and their "Uzbekization" process continued until recently, that is, until the national policy of the Soviet state. Thus, the present-day Uzbeks linguistically include the peoples of Iranian, Mongolian, Turkic peoples accompanied by ethnic groups.

However, the Uzbeks we are going to talk about are the "nomadic Uzbeks" who lived in ancient times and until recent times. To be precise, there are many opinions that this ethnic group of Uzbeks is the ethnonymic basis of the current Uzbek nation.

If the modern Uzbeks are considered to be the descendants of the ancient Bactrians, Khorezms, Sogdylers and later Turko-Mongol peoples of Central Asia (e.g. Turkic Khanate, Tiyrakhaniyler, Chagatai, Jushi, Timurids), those nomadic Uzbeks themselves are Tillaz. It is a widely accepted scientific opinion that the remnants of Ordading were the descendants of Sheybana's son and Abulkhayir, the last of the White Horde, and brought the term "Uzbek" to the land of Maveranakhr.

Nomadic Uzbeks are one of the largest ethnic groups, they are the descendants of the Uzbek Khan on the basis of Turko-Mongolian ethnic union, ethnic origin with the Karakalpak, Kazakh, Nogai, Kyrgyz people has almost one genesis.

Thus, the place where the nomadic Uzbeks were born was the Uzbek khanate, and many of the settled residents of Maveranakhr adopted the term Uzbek, bringing ethnonyms with them to the modern Uzbek nation. Furthermore, appearance of the uzbek owns a lot of oppositions and scientists have the following opinions:

According to the tradition, the name of Uzbek is polytonym and it appeared in Deshti-qipshaq. Sheybaniykhán introduced this term to Uzbekistan, Central Asia. There were many hypothesis on the appearance of Uzbek: according to the opinions by N.A. Aristov, P.P. Ivanov, G. Vamberi, M.A. Chaplichek, H. Huukam, "uzbek" is connected with Uzbek khan of Altin Orda. V.V. Bartold considered the people of Altin Orda who lived in Deshti-qipshaq as Uzbek. But Safargaliev mentioned Sheybana descendents as Uzbek.

However, most of the opinions say that Uzbek appeared in Deshti-qipshaq. B.D.Grekov hám A.Y.Yakubovskiy said that it is the group of turk-mongol tribes in Aq Orda and it is used for all of Jushi descendents. And it sometimes belonged to a part of Aq Orda. A.A. Semenov supported it: we may take it back of the period, but professor V.V. Grigorev said that there were not any uzbek, but

they lived in Kok Orda or Aq Orda. A.A. Semenov continued his thought: "Sheybaniyhan did not differentiated the Uzbek, he saw them as one nation, but later he made the Uzbek apart from the Kazak. Because they were considered as tribes of Shaybaniy descendents and the Kazak was considered to be the nation of East Qipshaq and Orda. A. A. Semenov concluding the article, noted the following:

1. It was not proved that the Uzbek got their name and originality from Altin Orda. If we consider some hypothesis by some scientists, it causes a big opposition that they were considered to be one nation with the Kazak, they lived in Deshti qipshaq and their conquers with other tribes, their leave to the East, the river of Chu and the fact that this nation became the Kazak.

2. The conquers between them caused Sheybaniy Uzbeks and Shingiskhan descendents, khans. The Uzbek who became weak in that conquer left in Deshti qipshaq and did not go to the Central Asia following Sheybaniy khan.

Akhmedov developing his thought understood that the Uzbek are the people who appeared from the former Sheybaniy Uzbek descendents. According to Abilgazi, tribes like Kushchi, Nayman, Karluk and Buyruk were involved in this descent. M. Kuhista pointed out that there were 27 tribes in Abilkhayir khan. Among them there were many from Jushi khan, but original Sheybaniy tribes were Kushchi, Nayman, Karluk. Qiyat, Qonirat and Mangit later belonged to this country. Tribes like Ming, Tarhan, Uysun, Oyrat were mostly descendents of Temuriy and belonged to Abilkhayir. So, there were more tribes than the former one and all of them created the term of "moving Uzbek".

The etnom of Uzbek itself appeared not only in the Central Asia, but also Deshti qipshaq in the mid 15th century. Ishakov stated that the Uzbek were the ones who obeyed Sheybanits. Later this term being polytonym included Mangit, Kazak and etc.

In order prove the thoughts mentioned above, we should have a glance at the history of Abilkayir khan country. Because there we can see the appearance of the Uzbek (not yet the current Uzbek).

Therefore, we decided to write about moving Uzbek and here is the history of moving turkiy-mongol tribes who were the base at first. The Uzbek country, secondly, is considered to Deshti qipshaq field.

In 1420, Uzbek country appeared when Altin Orda country which was in current Kazakhstan, Uzbekistan and South Russia disappeared. In other historical sources, it is called Abilkhayir khanlik, Abilkhayir descendents, Uzbek descendents.

The territory of Abilkhayir khan was in the West the river Ural, in the East the lake Balkhash, in the South the Aral sea and the Tobol and Irtysh rivers in the North.

It is noteworthy that it is called differently in different periods. It owned the land in the 14th and 15th centuries and by that time there were the Kazak as well.

When it comes to the Uzbek country, it situated in Nogay in the East, Mongolstan in the West and Temuriyler country in the south.

The name of the person Uzbek belonged to the 12th century. It appears in Arabic sources too. In the book of Usman-ibn-Munkizi (1188y) there was a head conqueror named Mosulada Uzbek in 1115-1116 yy. According to Rashid ad din, there was Uzbek Muzaffar, the latest representative of Ildegiz dynasty (1210-1225). In 1221, Djahan Paxlavan Ózbek Tay the military head of khorosmshakh Djalaladdin in Afghanistan.

So, the term of Uzbek appeared before mongols came to the Central Asia and Chingiz got this name.

In the East sources, some parts of this country got the name of Uzbek descendents. Even though Tokhtamis khan appeared after Uzbek khan died, Uzbek descendents was saved.

These moving nations country should be named "Abilkhayirkhan country", due to there were descendents of kazaks, karakalpaks, kyrgyzs and bashkirs.

As a result of mutual conquests, when Altin Orda was due to disappear, Orda-Edjen appeared from this. But Altin Orda khans Tokhtamys and Uzbek calmed down the conquests. But their economic conditions worsened.

After the death of Barak khan, the Uzbek country was divided into two being Chingge Tore (1428) and Nogay Orda (1440). Uzbek khan Abilkhayir ruled for 40 years and though the condition was not good. He conquered with lots of Jushi descendents.

In 1430, he had to be against Sheybanid Muhammed Xoja khan. This conquest ended with a triumph of Abilkhayir khan. And later he conquered with Akhmed and Makhmud khans. Then Abilkhayir owns the capital, Orda bazar. Then he owns the place of Sayin khan in a short period. So, he was then called to be the head of great country.

In 1446, he owned Signak, Arkun, Sozak, Akkurgen, Uzgen cities. Signak was the capital. Then in 1457, Abilkhayir khan lost in a short conquest in Signak. Abilkhayir hid in Signak, oyrats robbed Tashkent, Turkistan and Shahruh cities.

However, Uch-Temir-Taychi established a peace treaty with Abulkhayir, but its terms are unknown, but the opinion of historians is that he had a very bad relationship with Abulkhayir. In the 1460s, Jonibek and Kerey, who were fighting against Abulkhayir, marched to Yettisay and Mogilistan and created their own country, the Kazakh Khanate. The people who left there called themselves "Uzbek-Cossacks" (the word "Cossack" means "free" in the Navk language, which means "free Uzbeks"). Only then did the term Kazakh prevail.

Not long after that, Abulkhayir Khan died in 1468 in Aqqistaw, on the way to attack Kerey and Janibek.

It would be an understatement to say that the state of Abulkhayir Khan was founded on the ethnic group of the nomadic Uzbeks. After the death of Abulkhayir Khan, his state begins to collapse. His son Sheikh-Haydar Khan, who came to the throne instead of him, was born from his mother's Kunghirat tribe. Jonibek and Kerei, together with other sultans, came to the territory of Central Kazakhstan and overthrew his power and established their own power in its place in 1470-1471. At that time, the Nogai Khanate took over the northern lands of the Uzbek Khanate.

After that event, children and grandchildren of Khan Abulkhayir went to Kashkargul Khan, first with the people of Dashti-Khipchak under the rule of Sheibani Khan. At the beginning of the 16th century, the same Sheibanihan subdued the settled population in Maveranahr and occupied the Timurid state, bringing the Uzbek language there.

Ol Jonibek and Kerey Uzbeks invaded and there appeared the Kazakh Khanate and the ethnonym of Kazakhs. Due to the rule of Chigatoy's son and the expansion of the Kazakh Khanate, the Kazakhs included many Mongol-navk tribes of Chigatoy (Douglat, Sukan, Isut, Katagan, Kuralas, Sergelen (Sergeli), Alban, Uchtalarun).

After the Kazakh khans occupied the state of Abulkhayir, the rule of the Sheibanilers in Dashti-Khipchak ended. Urusids came to power, and his representative Burundiğ (1480-1511), the son of Kereydi, was the khan at first, and then Kashimjan, the son of Jonibekti, ruled. At that time, many pieces of Khungirat, Khipchak, Tiyruluq, Uighir, etc., which were part of the nomadic Uzbeks, came to the XVI Maveranahr, and the rest remained under the hands of Genghis Khan Kazakh Khans. goes

According to V. V. Bartolda, the historical essence of Abu-l-Khair khan (1428-1468) is simple. On the one hand, he joined the association of nomadic Uzbeks in Dashti-Khipchak and became the "creator of a great country", on the other hand, he was unable to join, and in the end he A large population of Kazakhs, who were opposed, appeared.

The ethnic composition of the Uzbek khanate was almost the same as that of the Nogai khanate. The population often consisted of konhirot, khipchak, chin-mochin, naiman, mangit, uysin, narigin, karluq, which were often interbred with each other. In addition to them, sources say that there are others such as burkut, utarchi, chimbas, keneges, bangidevona, karlaut, toymas, shadbakli,

madjar. It is clear that most of these tribes have now entered the Kazakhs of the Great and Middle Faces, Karakalpaks and mobile Uzbeks.

Concluding our thoughts, the nomadic Uzbeks during the time of Abulkhayrkhan (XV) and his descendant Sheibaniyhan (XVI) incorporated many types of Mongolian tribes and peoples into themselves. It is natural that the Uzbek people gave their father. It is inappropriate to say that they are the direct descendants of the Uzbek Khan, because they were connected only in a political situation and the historical category of "Moving Uzbeks" was established with the name of the political elite of that time.

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Rezyume: *Maqolada o'zbek xalqining Markaziy Osiyodagi o'rni va taraqqiyoti, etnik taraqqiyot tarixi haqida so'z boradi.*

O'zbek-xonlik mamlakati yoki qishloq o'zbeklari mamlakatining paydo bo'lishi, unga asos solgan xonlar tipi haqida ma'lumot.

Резюме: *В статье рассказывается о месте и развитии узбекского народа в Средней Азии, истории этнического развития.*

Сведения о возникновении страны Узбек-Ханлыг или страны сельских узбеков, тип ханов, ее основавших.

Kalit so'zlar: *Shayboniy o'zbek, Oltin O'rda, politonim, Abilxayir xon, etnik birlashma, etnik kelib chiqishi.*

Ключевые слова: *Шейбани Узбек, Алтын Орда, политоним, Абиляхаир хан, этнический союз, этническая принадлежность.*

CONTEXTUAL MEANING OF CONCEPT 'MUHABBAT' (LOVE) IN KARAKALPAK
FOLK PROVERBS

Sadullaeva A. N.

Karakalpak State University named after Berdakh

Summary: *This article discusses the various meanings of the concept 'Muhabbat' (Love) reflected in Karakalpak folk proverbs. In the basis of this article proverbs are studied and analyzed from the books of Karakalpak folklore which was published in Nukus, 1978 and 2019.*

Key words: *culture, concept 'Muhabbat' (Love), emotional love, mental love, proverbs, linguoculturology, history, society, loyalty, honesty, emotion, feeling.*

Nowadays the focus of attention of linguists is a person, who is a representative of a particular culture. Therefore, two scientific directions have been formed within the framework of this scientific paradigm: *linguoculturology*, which studies the language as a carrier of a certain national mentality, and *cognitive linguistics*, which considers the reflection of cognitive processes in the language [5].

The meaning of "concept" is explored in cognitive science, metaphysics, and philosophy of mind. The term "concept" is traced back to Aristotle's "The classical theory of concepts" definition of terms [1].

In linguistics, the term "concept" was borrowed from English-language literature in the mid-70s, when the problem of an adequate translation of this term in the works of foreign authors arose. Then the English word "concept" was proposed to be translated into Karakalpak as "túsinik" [8].

'Muhabbat' (Love) has been given different meanings in the history of social thought. In Greece, those who understood love as a mythical force ruling over people and nature, as a result, ideas about the god of love - Eros (Eros) arose. Empedocles saw 'Muhabbat' (Love) as a factor that organizes and unites the world - people and natural phenomena, Plato divides the concept 'Muhabbat' (Love) into two types - emotional love and intellectual love. According to Plato, emotional love is formed from the feeling of external beauty and constitutes the lower stage of love. Mental love arises from the moral-aesthetic, scientific understanding of beauty in a broad sense. He prioritizes mental (spiritual) love [6].

Central Asian thinkers also paid great attention to the issue of muhabbat. They understood muhabbat/love between people, including between a man and a woman, as a high relationship. It is known that Ibn Sina wrote a special scientific work about love. According to Yusuf Khos Hajib, the feeling of muhabbat/love is the basis of strong family life and social improvement. According to Lutfi, the concept 'muhabbat'/love is closely related to human appreciation, loyalty and honesty. Therefore, Alisher Navoi divides love (muhabbat) into 3 types: love that is realized in marriage between a man and a woman, love that is manifested in relationships between people in general, and love for God [2].

The concept 'Muhabbat' (love) at the level of love, kindness, loyalty is a manifestation of a strong feeling aimed at leaving a generation, preparing it for life as a biological phenomenon that exists in the genetic program of people and animals. This, in both animals and humans, manifests the extrinsic needs to maintain their vitality in the form of sexual relations [6].

The concept 'Muhabbat' (love) is not only a strong passion for the union of two sexes, but at the same time it is a powerful means of spiritual rapprochement with one's parents, relatives, loved ones, friends, neighbors, educational and work communities, one's people and Motherland, and humanity in general.

Thanks to love, an individual embodies a beautiful character and behavior, finds high value in front of a certain community and society, and can arouse sincere affection towards him in others.

Therefore, in the theory of knowledge, muhabbat/love is considered the beginning and condition of understanding the world and human relations.

A person understands the world, the natural and social environment in which he is surrounded, at the level of his muhabbat/love for them. Muhabbat opens the way to understanding the essence of people and things, illuminates the dark world, and also appears as a criterion for distinguishing good from bad, truth from falsehood. Muhabbat brings people, different communities, peoples, nations closer to each other. Where there is love, even complex problems are easily solved, and there is no room for wars or quarrels [6].

In the article, we tried to reveal the concept ‘Muhabbat’ (love) in proverbs of Karakalpak language through lexico-semantic analysis. Through this method, we tried to express the meanings of proverbs in the context through translation, to explanation and analysis.

As an object of the research of concept ‘Muhabbat’ (Love) in Karakalpak language served the books of *Karakalpak folklore Volume IV* [4] and *Karakalpak folklore – proverbs* [3].

We chose about thirty Karakalpak folk sayings and proverbs about muhabbat/love, and tried to make analysis of them. In the following examples we discussed the contextual meaning of the concept ‘Muhabbat’ (Love):

1) *Óz súygeniń ózińe,*
Húr kóriner kózińe [3; 113].

In word by word translation this proverb means – *To the one you love, seems beauty for your eyes*. As we can see the word ‘súygeniń’ translates as ‘**love**’ into English. That is, the concept ‘Muhabbat’ (love) is given as a *súygeniń*. In Karakalpak language the word ‘súygen yar’ shows the harmony with the concept ‘Muhabbat’ (love). Therefore, this proverb talks about fidelity, loyalty to love, being honest, not betraying one's spouse and lover.

2) *Jaqsı perzent – súyinish,*
Jaman perzent – kúyinish [3; 116].

This proverb discusses the relationship between parent and child. That is shown the difference between a child's respect and disrespect for a parent. It is said that a good child will never face the shame of his parents. But if the child is bad-behaved, it is said that he will embarrass his parents and relatives by burning them with his negligence. So, proverb says, a good child always brings respect to the parents, while the parent is disrespected with the bad-mannered one. The Karakalpak word ‘súyinish’ can be translated into English as ‘**respect**’ to the parent, however the Karakalpak word ‘kúyinish’ translated into English as ‘**disrespect**’.

3) *Súydiretuǵm da til,*
Kúydiretuǵm da til [3; 158].

Proverb says when a person speaks without thinking, he uses his words as a pretext and causes trouble for others. This means that a person expresses his or her behavior through words, that he or she may be loved or that others may have a negative view of him or her. By Karakalpak word ‘Súydiretuǵm’ means ‘**to make love** someone’, however the word ‘Kúydiretuǵm’ represents negative to the word **love**.

4) *Eldi súygen, elge dos* [3; 187].

There are different types of muhabbat/love in a context, which may be vary according to their object, like: *Love to Motherland, Love to Child, Love to Parents, Love to Spouse*, and etc. This proverb describes ‘**the love to motherland**’ that enmity and evil will never come out of a person who loves and respects the people. ‘A man who loves, he can be a true friend’ (word by word translation).

5) *Muhabbat degen duzlı suw,*
Isheseńde shólleyseń.
Qansha ashshı bolsada,
Ábizámzámgada bermeyseń [3; 189].

Here, **Love** is equated to **water** in order to show its necessity to humanity. It has been said that people drink water and become thirsty again and again. That is, when a person loves, he will become thirsty for love again and again unconsciously, he is thirsty for love, he is overwhelmed with emotion and feelings. It means that, happiness is found in the trials of love.

6) *Dostñ awırsa kúyin,*

Dushpanñ awırsa súyin [3; 195].

The meaning of this proverb is about **friendship**. If a close friend is in trouble, surely the real friend will feel sorry for him and want to help him. He sincerely mourns for him. It is a great sign of humanity to know him as a friend and to know him as a gift. The Karakalpak word 'dos' is translated into English as 'Friend', however 'dushpan' is translated as 'Enemy'. Hereby, the words 'kúyin' and 'súyin' are homonyms used in order to make it rhythmic.

7) *Ashshı bolsañ uwday bol,*

Tiygen jerin kúydırsın.

Dushshı bolsañ suwday bol,

Dushpanñ kelip súydırsın [3; 196].

According to these words of wisdom every person should be treated fairly. It has been said that you can turn an enemy into a friend by speaking to a person who has been hurt by bitter words so that he can draw a needed conclusion. In this proverb, the homonyms 'ashshı' – 'dushshı', 'kúydırsın' – 'súydırsın', 'uwday' – 'suwday' which are opposite in meaning and makes sense of harmony of life.

8) *Qansha tulpar bolsa da,*

Minip bolmas jalğızdı.

Qansha dana bolsa da,

Xalıq súymeydi azğımdı [3; 197].

Anaphors 'qansha' at the beginning of the line and epiphors 'bolsa da' at the end of the line used in order to increase meaning of the proverb and it means '**Many**' in English. The meaning of the proverb is: No matter how successful a single person is, he can't do anything because of his loneliness, and even if the man is a wise man but a traitor, he will never be liked by the people.

9) *Miynet súygen hesh waqıtta kem bolmas.*

Miynetten qashqandı adam dep bolmas [3; 9].

In this proverb, it is said that a person should not think of tricks when working, and work should be done wholeheartedly. That is, one who does not want to work looks for the light side of work, and no one likes a lazy person, it is implied that laziness is a bad habit.

10) *Ózi ushın xızmet qılğan adam,*

Ózi ushın otlağan mal menen teñ.

Xalıq ushın xızmet qılğan adam,

Adamnñn súygen ulına teñ [3; 11].

Some people only think about their own interests and do not care about others. In this proverb, our wise people said that a person who serves many people without thinking of deception will be praised and loved by everyone.

11) *Sútke suw qossañ,*

Súymesin boladı [3; 29].

Usually, our ancestors condemned the person who mixed water with white milk and sold it as a sinful person and as a dirty habit. Therefore, no one supports the action of a person who disobeys by adding water to milk, it is said that this is a shameful habit.

12) *Súy megenge súykenbe,*

Bahan keter [3; 86].

Everyone has their own favorite ones. For example, their thoughts and tastes may be similar. However, people with different opinions and views do not like each other. In the chapter on love, it

is said that you should be happy with the person who wants you, and you should not lose your self-worth to the person who doesn't want you.

13) *Ġarġa súyer balasın appaġım dep,*
Kirpi súyer balasın jumsaġım dep [3; 88].

In this proverb, every parent is told that even if their child is ugly or awkward, they are not aware of their child's defects and still love their child with parental love.

14) *Iyt júyriġin túlki súymes,*
Ġamlı kisi kúlki súymes [4; 70].

Usually, the fox, the wolf is the enemy of livestock. Therefore, a dog protects livestock to prevent it from being eaten by wild animals. It only protects the animals from pests. That is, a person with pain and sadness does not like to waste time like others. Therefore, it is said to refer to a person's mood and to understand it.

15) *Ayaġı úlken sıyġanın kiyedi,*
Ayaġı kishkene súygenin kiyedi [4; 89].

The shoes of a person with large feet also look large and ugly. A person with small feet wears shoes of a small size. It looks beautiful. Therefore, it is necessary to wear clothes in a good way.

16) *Sulrw – sulrw emes,*
Súygen sulrw [2; 89].

There are many beautiful people who are attracted by their beauty and nature among people. However, each person finds the person they loved to be unknowingly beautiful, no matter how many flaws they have.

17) *Ġúlsheli bala súymege jaqsı,*
Qazanġa túsken qapqa túspeydi [4; 144].

In this proverb, it is said that one should love and respect a person, that when he hears about the condition of older adults, he should bring a gift, something that is comfortable for his teeth. That is why it is said that what a person desires and wants does not happen and does not always come true.

18) *Tilenshiniń súygen asın kim bersin,*
Tentiregenniń kóz jasın kim kórsin [4; 146].

The proverb says that everyone is busy with their own problems, some people are not interested in the problems of their loved ones who are in a bad situation, they do not cheer them up, they only think about their own interests, and in this they are kind to each other. Humanity is a virtue such as divisiveness.

19) *Ángime súymegen,*
Digirman quradı.
Qonaq súymegen,
Balasın uradı [4; 154].

Some people don't like talking nonsense. Instead, they prefer to engage in some useful craft, habit. For example, after building a mill, he takes grain crops to the mill and uses them for the benefit of his house. However, some people do not like the visiting guests and beat their child, the child cries loudly and avoids the blessing of the family. The guest feels uncomfortable in this situation and feels that he is superfluous and that the host does not like him, which is definitely an act of incivility.

20) *Jaqsı sóz jan súysindiredi* [4; 157].

The proverb says that you can win someone's heart with a kind word, and you can turn any person away even from his mind.

21) *Ġúlge – ġúl ashıq,*
Ġúl – búlbilge ashıq,
Otırıspa sózge ashıq [4; 171].

All things are created equal. With a flower nightingale, sitting - with a party, dancing - looks ugly without pleasure.

22) *Patshadan ádalat ketse,*
Áskerinen ayrılar.
Kisi gápine ergen,
Súygeninen ayrılar [4; 225].

In the first line of the proverb, it is said that it is necessary for the head of the country to rule honestly, without it, he will lose respect and honor, but in the second line, it is a lie, and if he talks to a lover without knowing its true meaning, a person will lose his lover. It is said that you should not listen to unreasonable talk in any case.

23) *Xalıq súymegen qátqudanıń qádiri bolmas,*
Miyнет penen tabılǵan uwdırń záhári bolmas [4; 237].

In order to lead, a person must have a fair mind and intelligence. Therefore, it is said that what is earned by hard work is never lost.

24) *Ráhátli jaydı jánnet der,*
Muhabbat sonıń bir gúli,
Minnetli jaydı dozaq, der,
Dushpanlıq sonıń ushqını [4; 244].

In the proverb, it is meant that there is harmony and love in the family, it is as pleasant and blessed as in heaven, but if a husband and wife who find faults in each other and fight, it is like living in hell.

25) *Kúshi bar zalım xalıqtı,*
Sıylatpaq ushın jılatar.
Ádepli adam óz basm,
Súydirgennen sıylatar [4; 245].

Some officials lead their careers with their judgments, harsh words, and pressure. This means that a person looks beautiful with his manners. That's why everyone likes and respects a decent person.

26) *Awırıw adam as súymes.*
Úyrektiń kóbin ǵaz súymes,
Háwleki boydaq qız súymes [4; 272].

Some single guys deliberately find fault with simple things in girls, so they walk around with that singleness and nobody likes them. That is why it is said that a person should be able to recognize his faults in time.

27) *Yalǵanshı páni dúniyada,*
Arıwlar súygen ókinbes [4; 290].

The proverb says that everything should happen on time, that is, the meaning of life is to make a worthy choice, to have a child, and to raise it is the most important task for a human child.

28) *Kelinshekler qızıǵıp,*
Ishi kúygen jigirma bes,
Jipek shapan jelbigey,
Qızlar súygen jigirma bes [4; 304].

Twenty-five years is considered the most powerful time for a man. At this age, it was said that one should use that energy properly, without getting distracted by frolics and thoughtless activities.

29) *Hinji tisli arıwdı,*
Jılwalar menen barıwlı,
Sulıwdı súygen jigirma bes,
Qızıl shúberek kórinse,
Qıyal etken jigirma bes [4; 305].

In the proverb, it is said that a man should not do foolish things with recklessness, should know his place, should not make mistakes in making life, to love, and building a family.

As we have seen, it has become clear that the concept ‘Muhabbat’ (love) has several meanings and its meanings in Karakalpak folk proverbs are also different.

In our article, the theoretical frameworks of concepts were studied in the linguistic picture of the world, the lexical-semantic aspect of the concept ‘Muhabbat’ (love) in the Karakalpak folk proverbs was studied, and its lexical-semantic properties were analyzed [9].

Based on the lexical-semantic properties of concept ‘Muhabbat’ (love) in Karakalpak proverbs, we made the following conclusions:

1. In the process of studying Karakalpak proverbs, we can see that proverbs related to the concept muhabbat/love promote feelings of goodness, friendship, love, joy and loyalty to people.

2. A complex semantic structure, represented by various semantic units: *kúyinish* - disrespect, *súyinish* - respect, *kúygen* – charred, *súygen* - loved, *dosliq* - friendship, *dushpanliq* - hostility, *ashiq* - boyfriend, *muhabbat* - love, *súymes* - unloved and etc.

3. Mostly, derivatives of the Karakalpak word ‘*Súyiw*’ is the synonym of the phrase ‘*jaqsı kóriw*’ (to love) are used in order to describe the full meaning of the concept ‘Muhabbat’ (Love), like: *súygeniń* (n), *súyinish* (adj), *súydiretuǵın* (v), *súygen* (v), *súyin* (v), *súydirsin* (v), *súymeydi* (v), *súymegenge* (v), *súyer* (v), *súymes* (v), *súymege* (v), *súysindiredi* (v), *súydirgennen* (v) and etc.

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Rezyume: Ushbu maqolada qoraqalpoq xalq maqollarida aks etgan “Muhabbat” tushunchasining turli ma’nolari muhokama qilinadi. Maqolalar asosida 1978 va 2019 yillarda Nukusda nashr etilgan ‘Qaraqalpaq folklorı - Naqıl-maqallar, Xalıq awızeki dóretpesi’ kitoblaridan maqollar o’rganilib, tahlil qilingan.

Резюме: В данной статье рассматриваются разные значения понятия «муҳаббат», отраженные в каракалпакских народных пословицах. На основе статей были изучены и проанализированы пословицы из книг «Қарақалпақ фольклоры - Нақыл-мақаллар, халық ауызеки дәрептеси», изданных в Нукусе в 1978 г. и 2019 г.

Kalit so‘zlar: madaniyat, “Muhabbat” tushunchasi, ishqiy muhabbat, aqliy muhabbat, maqollar, lingvomadaniyatshunoslik, tarix, jamiyat, sadoqat, halollik, his-tuyg‘u.

Ключевые слова: культура, концепт «муҳаббат», романтическая любовь, интеллектуальная любовь, пословицы, лингвокультурология, история, общество, верность, честность, эмоция.

INTERNET DISCOURSE AND ITS STYLE

Akhmedova K. K.

Urgench state University named after Al Khorezmi

Summary: *In the following article, the concept of discourse, its application in linguistics, as well as the opinions expressed by linguists about discourse; Internet discourse which is considered a new form of discourse, the specific aspects of Internet discourse are widely analyzed. As well as the methodology specific to this form of communication, the manifestation of speech in the process of virtual communication are also studied.*

Key words: *discourse, Internet discourse, stylistics, colloquial style, business style, journalistic style, scientific style, artistic style, oral and written speech, verbal and non-verbal means, avatar, acronym, emoticon.*

INTRODUCTION

In linguistics, the term "discourse" was first used by the American scientist Z. Harris in the article "Discourse Analysis", published in 1952 [1]. In this article, he raised the question of how to determine what a text is. He was interested in the question whether a sequence of simple sentences could be a text. Z. Harris said that there is a system in language that is higher than syntax, and the concept of text belongs to this system. According to him, discourse analysis studies the structure of language on a much larger scale by sentence structure. He defines discourse as a statement made or written by one or more people in a given situation [2].

Only after the 1970s discourse analysis began to take shape as a separate direction in science. During this period, well-known linguists T.A. van Daele, W. Schif and others published scientific papers on this concept. Several approaches to discourse analysis have been introduced and several academic studies have been carried out in this regard.

V. E. Chernyavskaya investigated the concept of speech in connection with the concept of text and defined it as follows: "Reasoning should be understood as a text closely related to the situational context".

V. Z. Demyankov defined that "Reasoning is an arbitrary piece of text consisting of several sentences or an independent part of a sentence."

The linguist S. Stepanov commented on discourse in the following way: "Discourse is a system of language use that expresses a certain mentality or worldview as a result of the use of certain grammatical and lexical schemes". Karasik, a linguist, defined: "Discourse is the unity of a text and a communicative situation".

Discourse occupies a place along with speech and language and combines the features of both. In this regard, it is appropriate to recall another well-known figurative remark about the discourse by the famous linguist N.D. Arutyunova, discourse is speech introduced into life [3].

Today, various research materials related to linguistics mainly show the following types of discourse: political, military, religious, economic, scientific, pedagogical, journalistic, educational, official, journalistic, advertising, Internet, and so on. From this one can understand that there are discourses related to different aspects of human activity.

LITERATURE REVIEW.

Nowadays, it is almost impossible to find a person who is unfamiliar with the concepts of computers, social networks, and the Internet. This field has developed so much that we face it not only in the business world, but also in almost every aspect of our daily life. The fact that there is even a special science related to computers is a clear proof of our opinion.

Today, more than 3.5 billion people use the Internet [4]. This indicator is almost half of the population of the whole earth. According to Sherzod Akhmatov, the press secretary of the ICT

Ministry, at the press conference on December 11 last year, the number of Internet users in Uzbekistan has exceeded 22.1 million. The number of mobile Internet users is 19 million. The level of coverage of settlements with mobile communication is 97 percent, and mobile internet coverage is 87 percent. At the beginning of December, 70 percent of schools and 78 percent of health care centers were connected to the Internet[5].

The science of computational linguistics was formed in the USA in 1960. This science originated from the foundations of mathematical linguistics, which appeared in the middle of the 20th century. The formal model of the grammar of natural languages is the basis for the development of practical programs such as computer translation, language teaching, knowledge diagnosis, text editing, and has created a foundation for the direction of computer linguistics [6].

In our country, a number of scientists have conducted research in this direction. In particular, the researches of S. Mukhamedov, R.G. Piotrovsky, A..K. Polatov, S. Mukhamedova, S. Rizayev should be highlighted.

Research Methodology

When we study the specific aspects of Internet communication, the methodology specific to it is also considered important. First of all, let's talk about stylistics itself. Stylistics is derived from the Greek word "stylos", which means "pointed stick made of bone". The ancient Greeks wrote with a pointed stick on a waxed board. The top of this stick was like a shovel. They erased the wrongly written word by smoothing the wax on the board with the shovel-like side of the stick and corrected it with the pointed side. The word style comes from the words stiletto - thin dagger and stylo - automatic pen. The word style has long been used in the sense of "syllable, speech style" [7].

Styles are grouped according to the main function of speech forms as follows: a.) conversational style; b.) official style; c.) scientific method; d.) journalistic style; e.) artistic style. Conversational style refers to the lively conversational form of speech. In this case, there are a lot of language units specific to dialects, there are also many language units that serve for daily communication and communication, mutual relationships, and communication. Also, there are a lot of lexical units related to everyday life (barbarism, vulgarisms) characteristic of other languages, and sincerity, nationalism, simplicity and freedom are strong in this speech [8].

Scientific works, textbooks and manuals on various fields of science and technology are written in a scientific style. The scientific method differs from other methods in that it is rich in scientific conclusions based on accurate information. In the scientific method, scientific terms specific to each discipline are used, in this method, the word is used in its own sense, a separate part that serves to reveal the content of the rule or definition, an introductory word, an introductory compound, also, conjunctions are widely used. The decision, law, regulation, international document issued by the state office is written in an official-departmental style. Also, applications, receipts, references, summonses, invitations, contracts, biographies, announcements, descriptions, deeds, reports, etc. The document in the official-departmental style should be short, clear and understandable for everyone. The main sign of this style is that the sentences are in the same pattern, in the same form. In this method, words are used in their meaning, some abbreviations known to many people are used, specific terms of each field are used[9].

Journalistic style is the style of mass media (newspaper, magazine, radio, television), speech style used in meetings of the Oliy Majlis and various conferences. Journalism serves to convey the most important and topical issues of the time to its readers, students, and listeners through newspapers, magazines, radio, and television, to enliven the masses, to instill in people's minds what is happening around them, and to form their social views. An important feature of this style is to provide information and influence, it has the characteristics of simplicity, impressiveness, comprehensibility, strict adherence to the standards of literary language, active attitude to certain social issues, immediacy, and impressiveness. . A speech style that expresses a certain reality figuratively through the means of artistic images and thus has an aesthetic effect on the listener is

considered an artistic style. Figurative and aesthetic effect is an important sign of artistic style. In this style, along with including all the possibilities of the literary language, lexical units related to Uzbek dialects, professions, and historical words that have gone out of use today are used through the speech of the characters. All styles, except artistic style, are limited within a certain sphere of social life [10].

ANALYSIS AND RESULTS

In real life, communication takes place through verbal or non-verbal means. Interlocutors on the Internet cannot see or touch each other (except for video calls). That is, during the virtual conversation, they will not have non-verbal means of communication. This, in turn, leads to a lack of emotionality during communication. But with this we cannot say that the form of verbal communication in the social network does not acquire emotionality at all. The virtual environment is an imitation that reflects the emotional state of the participants of the dialogue through discourse. The lack of emotional connection creates the need for the participants of the dialogue to express their feelings verbally, as well as through signs and pictures.

In the discourse of the virtual environment, speech is characterized by the use of various avatars, nicknames and acronyms. The feelings and mood of the participants of Internet communication are expressed through emograms.

The Merriem-Webster dictionary defines the word avatar as follows: An electronic image that represents and may be manipulated by a computer user (as in a game). Veronika Chursina explains what an avatar is as follows: Аватар – это фотография, картинка или любое графическое изображение небольшого размера, с помощью которой можно «опознать» и идентифицировать пользователя.

As can be seen from the above comments, an avatar is a picture, a graphic drawing used by a network user and through which information about the user can be obtained. Acronyms, on the other hand, are a form of abbreviations, and are words made up of the initial letters of each word in a name or phrase.

Emograms are defined as follows: Изобретение относится к способам передачи сообщений, а именно передачи сообщений с фотографическими объектами, которые выражают эмоции пользователя[11]. It is used by network users in mutual correspondence to convey their feelings or moods to the interlocutor in a short period of time, and it has the ability to show the user's facial expression through graphic design. The main purpose of using these is to save time and get rid of typing letters on the keyboard. During online communication, the use of such colorful pictures, symbols, graphs, and forms is carried out because there is no possibility to transmit voice, movement, etc. in network correspondence.

Speech appears in two forms: oral and written. Each of these has its own rules. Spoken speech has pronunciation rules, while written speech has spelling rules.

Many researchers believe that Internet communication reflects a hybrid of both oral and written speech[12]. This communication tool has the ability to perform almost all functions that are impossible for other communication tools, and therefore it is no exaggeration to call it a new form of communication. The famous scientist David Crystal expresses the essence of this communication through the following original formula: "oral form of speech + written form of speech + computer symbols" [13].

Uzbek linguists also recognize a new type of discourse - written conversational speech. Speech activity on the Internet is inevitably related to oral speech, deviations from the norms of the literary language in phonetic, morphological and syntactic units, abbreviations, vocabulary specific to the non-literary layer, as well as special graphic design of the network. reflects a new direction of virtual communication[14].

CONCLUSION/RECOMMENDATION

As special aspects of the Internet discourse, we can mention some of its features. In particular, it is now widely used by many people as an alternative communication channel. In particular, the existence of a large number of various means of communication, for example, telephone communication, mobile communication, SMS notification, etc., is a proof of our opinion. Remoteness is also very important. Because it is important for people to be able to establish communication even at any distance. The anonymity of the communication is the basis of the fact that no monitoring or control is established over the communication-relationship. People communicating on the social network do not know anything about each other except for their nicknames and the information they transmit, and this is good for the participants of the conversation. The informal and entertaining nature of the virtual environment gives the participants the opportunity to convey any information about themselves as correct, and to hide the information they want. Through this, they establish free communication. In addition, not only linguistic, but also paralinguistic tools are widely used in computer texts, for example: pictures, figures, graphics. Even paralinguistic tools such as the font, size, appearance, color of the text can perform a specific task during communication. In particular, the ability to convey emotions, facial expressions, and mood using graphic tools contributes to making the communication process more convenient, understandable, and fast. From the information presented above, it became clear that the Internet discourse can be extremely emotional, because it uses not only verbal but also non-verbal means. As we mentioned, the Internet discourse includes elements of both oral and written speech. In this respect, it differs from real communication. Written conversational speech is becoming more and more popular and is the center of attention of many researchers.

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Rezyume: *Quyidagi maqolada diskurs tushunchasi, uning tilshunoslikda qo'llanilishi, shuningdek, tilshunoslarning diskurs haqida bildirgan fikrlari; diskursning yangi ko'rinishi hisoblangan internet diskursi, internet diskursining o'ziga xos jihatlari keng tahlil qilinadi. Shu bilan birga, muloqotning ushbu ko'rinishiga xos uslubiyat, nutqning virtual aloqa jarayonidagi ko'rinishlari ham o'rganiladi.*

Резюме: *В следующей статье понятие дискурса, его применение в лингвистике, а также мнения высказанные лингвистами о дискурсе; интернет-дискурс который считается новой формой дискурса, специфические аспекты интернет-дискурса широко*

анализируются. При этом изучается и методология специфическая для данной формы общения, проявления речи в процессе виртуального общения.

Kalit so‘zlar: diskurs, internet diskursi, stilistika, so‘zlashuv uslubi, rasmiy uslub, publitsistik uslub, ilmiy uslub, badiiy uslub, og‘zaki va yozma nutq, verbal va noverbal vositalar, avatar, akronim, emogramma

Ключевые слова: дискурс, интернет-дискурс, стилистика, разговорный стиль, деловой стиль, публицистический стиль, научный стиль, художественный стиль, устная и письменная речь, вербальные и невербальные средства, аватар, акроним, эмограмма.

УДК 413.162

INTERNATIONAL TERMS OF POSSESSIVENESS IN ENGLISH LANGUAGE

Seytova D.U., Kulametova B.K.

Karakalpak State University named after Berdakh

Summary: *This article is dedicated to the means of expressing international terms of possessiveness in the English language, determined by the importance of the place occupied by possessiveness in the system of the English language.*

Key words: *language, system, semantic, expression, structure, language, place, term.*

This article is an attempt to describe the means of expressing international terms of possessiveness in the English language, determined by the importance of the place occupied by possessiveness in the system of the English language, the originality of its functioning and the need for further study of the semantic structure of the category and multi-level means of its expression.

Possessiveness is considered by us as a sign that has both a plan of expression and a plan of content, taking into account, when analyzing the main means of expressing possessiveness relations, not only a synchronic, but also a diachronic factor, which is important for characterizing the change in the "picture of the world", in highlighting the textual functions of possessiveness, and also the nature of the "refraction" of possessive relations when translating from one language to another.

Possessiveness includes two features: belonging and possession. Ownership relations between two objects (in the grammatical construction, between the owner and the possessed) arise primarily in those cases when the object of possessiveness is expressed by a name belonging to the class of words denoting possessiveness.

In modern studies, possessiveness is defined as a universal semantic-syntactic category that reflects such relations between two objects, when one of them is considered as an element of the "personal sphere" of a subject, or when one subject has the right to own, use and dispose of some or an object.

"...принадлежность (посессивность) - это такое отношение между объектами внешнего мира, при котором один из них (объект обладания, обладаемое) "включается" в другой (обладатель, посессор), составляя с ним единое целое."[1].

The morphological system of language reveals its properties through the morphemic structure of possessiveness international term. It follows from this that morphology as part of grammatical theory faces the two segmental units: the morpheme and the term. But, at we have already pointed out the morpheme is not identified otherwise than part of the term; the functions of the morpheme are affected only as the corresponding constituent functions of the term as a whole. Within the framework of different linguistic trends and theories the word is defined as the minimal potential sentence, the minimal free linguistic form, the elementary component of the sentence, the articulate sound-symbol, the grammatically arranged combination of sound with meaning, the meaningfully integral and immediately identifiable lingual unit, the uninterrupted string of morphemes, etc.

American scholars-representatives of descriptive linguistics founded by L. Bloomfield recognized not the term and the sentence, but the phoneme and the morpheme as the basic categories of linguistic description, because these units are the easiest to be isolated in the continual text due to their "physically" minimal formal elementary segmental character: the phoneme being the minimal formal segment of language, the morpheme, the minimal meaningful segment.

In fact, if we take such terms of possessiveness as well as their simple derivatives e.g. watery, passer, yellowness, we shall easily see their definite nominative function and unambiguous segmental delimitation, making them beyond all doubt into “separate words of language”.

But if we compare with the given one-stem international terms of possessiveness the corresponding composite formations, such as waterman, password, yellow back, we shall immediately note that the identification of the latter as separate words is much complicated by the fact that they themselves are decomposable into separate terms. One could point out that the peculiar property distinguishing composite terms from phrases is their linear indivisibility, i.e. the impossibility for them to be divided by a third term. As for criterion according to which the term is identified as a minimal sign capable of functioning alone (the word understood as the “smallest free form”, or interpreted as the “potential minimal sentence”), it is irrelevant for the bulk of functional terms which cannot be used “independently” even in elliptical responses (to say nothing of the fact that the very notion ellipses essentially their opposite of self-dependence).

In spite of the shown difficulties, however, there remains the unquestionable fact that each speaker has at his disposal a ready stock of naming units (more precisely, units standing to one another in nominative correlation) by which he can built up an infinite number of utterance reflecting the ever changing situations of reality.

This circumstance urges us to seek the identification of the word as a lingual unit-type on other lines than the “strictly operational definition”. In fact we definite the clarification of the problem in taking into consideration the deference between the two sets of lingual phenomena: on the one hand, “polar” phenomena: on the other hand, “intermediary” phenomena.

Within a complex system of interrelated elements, polar phenomena other most clearly identifiable, they stand to one another in an utterly an ambiguous opposition. Intermediary phenomena are located in the system in between the polar phenomena, making up a gradation of transitions or so-called: continuum”. By some of their properties intermediary phenomena are similar or near to one of the corresponding poles, while by other properties they are similar to the other, opposing pole. At the same time this kind of analyses helps evaluate the definitions of the polar phenomena between which a continuum is established.

In this connection, the notional one-stem international term of possessiveness and the morpheme should be described as the opposing polar phenomena among the meaningful segments of language; it is these elements that can be definite by their formal and functional features most precisely and unambiguously.

As for functional terms, they occupy intermediary positions between these poles, and their very intermediary status is gradational. In particular, the variability of their status is expressed in the fact that some of them can be used in an isolated response position (for instance, words of affirmation and negation, interrogative terms, demonstrative etc.) while others cannot.

The nature of element of any system is revealed in the character of its function. The function of terms is realized in their ruminative correlation with one another. The «negative» immediately connects these functional international terms of possessiveness with the directly nominative, notional terms in the system.

The morpheme is a meaningful segmental component of the term ; the morpheme is formed by phonemes as a meaningful component of the term is elementary.

The morphological means of expressing possessiveness include, first of all, the category of possessive pronouns. Possessiveness - one of the universal conceptual categories of the language, the main meaning of which is the definition of the name of an object through its relation to a certain person or object.

Possessiveness is associated with such categories as determination , attribution semantic relativity. Possession is regularly expressed by lexical, syntactic, morphological means, the set of which is individual for each language.

Verbs (top predicates) with the meaning ‘to

have', 'to possess' form the so-called possessive sentence construction; its formal coincidence with the predicative construction sometimes serves as the basis for highlighting a special possessive structure of the language.

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Rezyume: *Ushbu maqola ingliz tili tizimidagi egalik o'rni muhimligi bilan belgilanadigan ingliz tilida xalqaro egalik atamalarini ifodalash vositalariga bag'ishlangan.*

Резюме: *Данная статья посвящена средствам выражения интернациональных терминов притяжательности в английском языке, определяемых важностью места, которое занимает притяжательность в системе английского языка.*

Kalit so'zlar: *til, tizim, semantik, ifoda, tuzilma, til, joy, atama.*

Ключевые слова: *язык, система, семантика, выражение, структура, язык, место, термин.*

THE ISSUES OF DEVELOPING OF VISUAL SCIENCE IN SCHOOLS

Khojamuratov Q. B.

Karakalpak State University named after Berdakh

Summary: *The article deals with the development of fine arts in schools, discusses various methodological techniques. These methodological techniques are widely used in schools of fine arts.*

Key words: *School, art, graphics, lesson, process*

One of the most important tasks set before the modern methodology is the independent work of students and the acquisition of additional knowledge. One of the important requirements of pedagogy for self-description and teaching of graphic works ensures the effective management of the lesson by the teacher.

Improving the efficiency of drawing in school will often depend on checking and evaluating students' creative work. This, in turn, will contribute to the activation of the school service, and secondly, the careful development of educational materials by students. During the lesson, maintaining the interest of students in drawing, showing a lack of poorly mastered students, re-explaining the teacher, as well as helping, without humiliating them, "You read poorly, I give you a low grade" lead to very good results. [1, 23]

Verification of students' creative works will be carried out in stages. The first examination can be carried out after the students have done creative work. At the same time, it is checked how and in what order the student places the drawing on paper, which is drawn. Dimensions, dimensions of the product being drawn, geometric structures will be closely monitored. If you directly fulfill the drawing requirements, you can color the image, that is, go to the next step.

In case of violation of drawing requirements, errors should be well explained to the reader. The second check aims to fully comply with the requirements of the visual arts. At the same time, the degree of drawing of the drawing, shortcomings in drawing are checked and the work of artist-masters to eliminate these shortcomings are indicated. So they will be carried out, and at the last check the corresponding assessment will be given.

The teacher must achieve the following tasks for the effective management and development of drawing:

- a) the formation of a sense of interest in drawing among students and the development of knowledge in it;
- b) ensuring timely fulfillment of the assigned home task;
- d) identification of independent extracurricular work;
- e) ensuring the student's participation in the extracurricular additional circle "subject of drawing";
- f) development of the student's search ability over himself.

The development of visual knowledge among schoolchildren is a complex process that is closely related to the learning process. Many years of observation by drawing specialists show that often students gain knowledge of the subject of drawing mainly by performing individual educational and graphic works. Since the theoretical knowledge gained during the course of the lesson is mainly strengthened through painting classes. Students of higher education institutions and vocational colleges must perform individual graphic work established by the drawing program. Any teacher sets himself three main goals in teaching, issues of education, upbringing and development of the student's personality. At the same time, great skill is required from the teacher, the teacher must look for answers to the question: "In what form can I give students effective knowledge, what should I do to develop drawing?" [2, 14]

In the drawing class, the teacher can use exhibition style, interpretation methodology, practical style, film adaptation style, question-answer method and didactic methods. A special role in the use of game methods in drawing. The use of single cards in game forms will contribute to the development of individual literacy of students. The game "Question-Answer" educates students in deep memory of drawing terms, as well as in the best. Mathematical and smart gymnastics is the science of drawing, developing a person's ability to think deeply. We see this side of the science of drawing when using a black box method of play.

The game "Black Box" arouses interest among schoolchildren. In this game, the following question is posed: "In this box there is a photo of the creative work of one of the artist-masters (this is told), whose work is this? " On the given question, students must describe the memos. The teacher releases a photo of creativity hidden inside a black box and is compared to the look of the teacher. So, in a black box you can hide a photo of other complex creative works. The teacher can solve the development of drawing not only in the course of classes, but also in extracurricular work. For example, you need to organize a circle "subject of drawing," publish wall newspapers.[3,1-2-3-4] Wall-mounted newspapers dedicated to the subject of drawing at the school provide independent work for students. A task on this board can draw the latest news in the drawing area, ask options for questions, ask test questions. Students interested in drawing are hastily waiting for every clean issue of this wall-mounted newspaper. To the questions asked in it, he writes down the answers or assigns direct answers to test questions, packs them in an envelope and places them in a special box.

The teacher checks these answers, identifies the best reader, and during the lesson sets an example for other students.

Thanks to this method, it is possible to organize competitions among students, ensure their strong interest and search. Thus, one of the key issues in the development of drawing is to ensure that the lesson is taught effectively.

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Rezyume: Maqolada maktablarda tasviriy san'atning rivojlanishi haqida so'z boradi, turli uslubiy texnikalar muhokama qilinadi. Tasviriy san'at maktablarida bu o'qitish usullaridan keng foydalaniladi.

Резюме: В статье рассматриваются вопросы развития изобразительного искусства в школах, рассматриваются различные методические приемы. Эти методические приемы широко используются в школах изобразительного искусства.

Kalit so'zlar: Maktab, san'at, grafika, dars, jarayon

Ключевые слова: Школа, искусства, графика, урок, процесс

RELIEF FORMATIONS OF USTYURT

Kurbanbaev R., Bakhiev K., Asanov U., Bekmanov N., Kurbanbaev U.
Karakalpak State University named after Berdakh

Summary: *The article analyzes the geomorphology of Eastern Ustyurt, its connection with the seas, marine regression and transgression. That is, based on the studies of Pinkhasov and Leonov, the stratigraphic position of layers and rocks, regression and transgression of the seas, the movement of rivers from north to south, from south to north, i.e., the direction of the turn of river channels to the south or north, were analyzed. Also, based on the data of the analysis of scientists Leonov, the climate before this period changed three times for a warm period, three times for a cold period, that is, during the warm period, the direction of the rivers turned to the equator, and in the cold period they turned to the north. When the climate goes into a warm period, we see that some areas are flooded by the Sarmatian and Apsheron seas, and that the opinion of the brilliant scientist Beruni is true, that rivers turn into dry land and dry land turns into rivers.*

Key words: *Ustyurt, ledge, Aral, Aral Sea, sea, land, plateau, chink, tertiary, scale, carbonate, rocks, in the east, continental, weak, formation, limited, southern, development, watercourses, Jurassic, environment, exposed, complex, influenced, Sarmatian, relief, general, schemes, stratigraphic, plains, Tortonian, limestones.*

Introduction Eastern Ustyurt is a vast part of the Ustyurt Plateau, located between the Aral Sea in the east and the Caspian Sea in the west, as well as between the lands of the Southern Aral Sea, including the former water area of the Aral Sea.[3].

The Ustyurt Plateau is an elevated plain with absolute elevations of 100 - 190 m, bounded by clearly defined ledges (chinks).[3].

Ustyurt is a part of the Turonian Plate and belongs to the Central Eurasian Platform. The foundation submerged to different depths is covered by a weakly dislocated platform cover and is represented by two structural tiers. The lower includes rocks formed at the early stages of geosynclinal development: in the east, in the Precambrian, Early Paleozoic, and, partially, Silurian; in the center and in the west - in the Precambrian, early and middle Paleozoic.

The surface is composed mainly of marine tertiary (Sarmatian) carbonate rocks.[3].

Since the beginning of its continental development, this territory has not been exposed to permanent watercourses, the desert environment had little effect on the geological age.

The geological age of the Ustyurt Plateau is approximately 21-23 million years. Serious scientific study of it began only with the onset of the 1980s. Usually, the territory of the Ustyurt plateau is defined as follows: between the Mangyshlak (Mangistau) peninsula and the Kara Bogaz-Gol Bay in the west, the Aral Sea and the Amudarya delta in the east. Ustyurt is a part of the Turan epihercynian plate, in the section of which the Jurassic-Cenozoic platform cover, the Upper Permian-Triassic transitional complex, and a heterogeneous folded basement composed of rocks are distinguished [3].

Below is a general stratigraphic scale (B.I. Pinkhasova Tashkent fan of the Uzbek SSR 1984)

General stratigraphic scale					Correlation of local stratigraphic schemes
Systems	Division	Subdivision	Tier	Half tier	Eastern Ustyurt
Neogene	Miocene	Upper	Sarmatian	Middle	Limestone marl. Shellfish: Mactra vitaliana Orb.M. subvitaliana Koles Tapes gragaria Partschi. 40m.

		Middle	Tortonian	Lower	Marls, clays, limestones. Mollusks: Cardium praeplicatum Hilb, C. ustyurtense Andrus, Donax Incidus Eichw.
					Horse mountains. Mergeli, clay. Shellfish: Ervilia trigonala Sok. Cardium hispidum Eichw
					Karagan mountains. Margeli, clay-8m
					Chokrasky mountains. Sandstones, siltstones. Mollusks: Donax, tarchanensis Andrus. 15 m.
					Tarkhansky mountains. Clays, sands. Shellfish: Ostrea gryphoides Schloth 5-8m.
		Helvetian			Oncophoric layers. Clay sands. Foraminifera: Saccamina zuramakensis Bogd.S. variabilis Bogd, Reophax splendidus Grzylb. 3-20m.
		Lower	Burdigalian		Kintykhinskaya suite. Sands, sandstones. Shellfish: Pitar (Callista) ex gr. splenschinella Splendida Merkl. Lentidium (Janschinella) kuzhasaica Merkl.
			Aquitaine		Aral Formation Clays interbedded with siltstones and sands, Mollusks: Corbula helmerseni Merkh..7-10 m
			Aquitaine		Tops of the Baigubek Formation Sands with interlayers of clays and siltstones, Mollusks: Corbula helmerseni Merkh. Panope menardi Desh. Cyrtodaria neuvillei Cossm.et Peyr. 6 m

Results and discussions: The geological age of the Ustyurt Plateau is approximately 21-23 million years. The Ustyurt Plateau is composed of sedimentary rocks of the Neogene, from the surface - Sarmatian limestones, under which marls, clays, limestones, sandstones, gypsums occur.

This period was characterized by arid climate and gradual cooling [4]

The plateau is subdivided into such large structural and relief components: the North Ustyurt syncline, the Central Ustyurt uplift, the South Mangistau-Ustyurt depression, the Kuanysh-Koskalin swell, part of the Aral system, which also includes the Sudochy trough and the Takhtakair swell located to the east.

At the beginning and middle of the Cenozoic era, the plateau was the bottom of the ancient Tethys ocean, which existed between the ancient supercontinents Gondwana and Laurasia, two parts of the protocontinent Pangea that broke up in the Mesozoic era.

The limestones of Ustyurt have many inclusions of shells, and some of their layers are real, and continuous, shell rock. Other witnesses of ancient geological processes are the so-called stone balls, most often partially destroyed, similar to bitten apples, iron-manganese spherical nodules, usually formed on the seabed, at great depths.

From a geological point of view, the Sarmatian Sea, stretched from the present Vienna in the west to the foot of the Tien Shan in the east and included the modern Black, Azov, Caspian and Aral Seas. [4].

The Sarmatian Stage is represented by marine and continental deposits—limestones (predominantly shell), clays, sands, and sandstones. Deposits of this stage are distributed in the south of the European part of Russia and Central Europe.[4].

The Sarmatian deposits, in comparison with other sediments of the Miocene seas, are the most widespread and thickest. The age of the rocks of the Sarmatian stage is reliably dated by the fauna of mollusks contained in them [4]. according to A. G. Eberzin, one is forced to believe that in the Early Apsheronian this depression was occupied by a vast brackish water lake basin, connected with the Sarykamysh one [4].

In the Caspian lowland, after the regression of the sea at the end of the Akchagyl age, a new transgression of the Apsheron Sea began. It also developed discontinuously, which makes it possible to subdivide its deposits into three parts. The layers of the lower Apsheron are characterized by greenish-gray, in some places brownish-gray sandy clays, sands and silts containing representatives of the genus *Dreissena*, as well as a depleted ostracod complex; thickness up to 80-100 m [4].

The Middle Apsheron deposits, sometimes overlying the Lower Apsheron, sometimes the Akchagyl or various older ones, are composed of dark gray clays and inequigranular and sands up to 220-240 m thick. At the base are marsh plant remains and freshwater ostracods, above a diverse fauna of marine mollusks: *Parapscheronia raricostata*, *Pseu -docatillus catilloides*, etc. [4].

The Upper Apsheron layers are composed of dark gray clays interbedded with sands, sandstones, and silts; thickness - 120-150 m. There is a depleted complex of marine mollusks: *Apscheronia pro-pinqua*, *Monodacna laevigata* and others; in the peripheral areas, freshwater mollusks of the genera *Potomida*, *Unio*, *Viviparus* and others.

There, the deposits of the Shahshah Formation of the Akchagyl Sea, judging by the foraminifers and ostracods, are overlain with erosion by the proluvial sands and gravel beds of the Kokuryum Formation, which contain the egg shell of the ostrich *Struthio* sp. The thickness of the Kokuryum suite, which was deposited in the Apsheron Age, is usually 2-3 m, the largest is 20 m. Lazarev in the Aral Sea and on its northern coast. The fauna was also found during the drilling of the Sadyvar Formation in the middle reaches of the river. Amu Darya. The deposits of the Apsheron Sea are represented by limestones, inequigranular and sands, sandstones, clays; thickness from a few meters to 100–150 m [4].

At present, the Amu Darya flows in a northwestern direction, cutting through the desert part of Central Asia, flows into the Aral Sea, has it always flowed in this direction, many researchers (ancient and modern) have written that the Amu Darya has changed its direction several times during its existence, then to the northeast, then to the southwest. This is confirmed by the remains of numerous channels filled with river sediments in the flat terrain of Central Asia and the statements of local residents about the wandering river "Zhaykhundarya".[1].

Many researchers associate all these changes in the currents and directions of the river with climate change under the influence of the earth's rotation (Coriolis force). It is known that the flow of the river under the action of centrifugal force in the northern hemisphere tends to the equator, in Central Asia to the south this law is characteristic of the period of climate change on earth. The rotation of the earth sometimes accelerates, then slows down after a certain time has passed, when the rotation of the earth slows down, a warm period sets in on the earth, and when it accelerates, the climate on the earth becomes colder. [1].

During the period of cooling, rivers located in the fortieth geographical latitude move to the left, i.e.to the equator, and during periods of warming they move to the right, i.e.to the north, the flow of rivers located in the meridional direction tends to the pole of the earth. Obeying this law, the Amu Darya wandered when the climate changed, migrating either to the right or to the left.

Meanwhile, the first, very interesting theory about the migration of the rivers of Central Asia belongs to the brilliant scientist of the 11th century, Al-Beruniy, which is given by him on the basis

of an analysis of ancient channels and other traces of water activity, which is almost at the level of geological theories of the 19 th century, the concept of Amudarya migration, thus giving the first scientific explanation of the origin of the Kelif Uzboy and Unguz, the ancient channels of the northern Kyzyl-Kum and, finally, the Ustyurt Uzboy.[1].

He tries to explain changes in the direction of the river flow by natural historical factors, a change in the basis of erosion of a particular river, drifting of the channel, i.e. siltation. However, they do not take into account other factors that cannot be ignored, since another natural force also acts on the change in the direction of the river flow, for example, the rotation of the earth Coriolis strength.[1].

In any case, the theory of Beruniy is a brilliant document, naturally, the scientific thought of early - medieval Central Asia.

As a result of many years of research, scientists have determined that in the last 4500 years on earth, the cold period was replaced by a warm period three times. Below in tabular form are data on climate changes on earth over the past 4500 years (Table 2) [4].

Table 2 - Change of periods of cooling and warming (according to Leonov N.I.)

Periods	Maximum	Culture
Cooling	Mid III-millennium BC.	Late Neolithic (New Age) Chalcolithic
Warming	Mid II-thousand BC	Bronze Age
Cooling	Mid of the 1st millennium BC	Iron Age (beginning) Ancient period
Warming	Mid of the 1st millennium AD	Early Middle Ages
Cooling	Mid of 2nd millennium AD	End of the Middle Ages
Warming	Our time, the maximum has not yet come	XIX-XX century the beginning of the III millennium

Many researchers associate all these changes in the currents and directions of the river with climate change under the influence of the earth's rotation (Coriolis force). It is known that the flow of the river under the action of centrifugal force in the northern hemisphere tends to the equator, in Central Asia to the south, this law is characteristic of the period of climate change on earth. The rotation of the earth sometimes accelerates, then slows down after a certain time has passed, when the earth's rotation slows down, a warm period sets in on the earth, and when it accelerates, the climate on the earth becomes cold.[1].

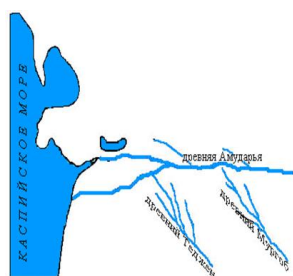
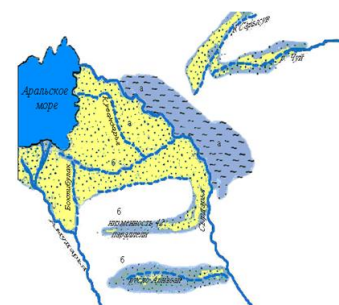


Figure 2 - During periods of cooling, all the rivers of Central Asia, under the influence of centrifugal force, turned their direction towards the equator. The ancient Amu Darya, Tejen and Murgap flowed into the Caspian Sea (According to N. I. Leonov)

Figure 3 - Periods of cooling of the river. The Syr Darya either along the Arnasay channel, or along the lowland of the 42nd parallel, or along the Zhanadarya channel flowed into the Amu Darya. During periods of warming, it flowed into the Aral Sea. [1].



Findings

From the above materials, we can conclude that the formation of the relief of Ustyurt was due to the transgression and regression of the seas, that is, the diversion of rivers to the equator or to the north, as well as large-scale tectonic movement of the earth's crust. When the climate changed,

the Amu Darya wandered, migrated to the right, then to the left, and participated in the creation of the terrain.

According to geological and geomorphological data, the Ustyurt Plateau has deep depressions, in which Upper Pliocene lacustrine, alluvial-proluvial, deluvial-proluvial, and sometimes marine deposits are located: uneven sands, sandstones, gravels, conglomerates, loams and clay soils. The plateau is subdivided into such large structural-relief components: the North Ustyurt syncline, the Central Ustyurt uplift, the South Mangistau-Ustyurt depression, the Kuanysh-Koskalin swell, part of the Aral system, which also includes the Sudochy trough and the Takhtakair swell located to the east.

The advance on the land of the warm period led to the transgression of the seas and with the acceleration of the cooling of the climate on the earth began the tectonic movement of the earth and the transgression and regression of the seas created the main relief of Ustyurt.

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Rezyume: Maqolada Sharqiy Ustyur geomorfologiyasi, uning dengizlar bilan aloqasi, dengiz regressiyasi va transgressiyasi tahlil qilingan. ya'ni Pinxasov va Leonovlarning tadqiqotlari asosida qatlamlar va jinslarning stratigrafik holati, dengizlarning regressiyasi va transgressiyasi, daryolarning shimoldan janubga, janubdan shimolga harakati, ya'ni daryoning burilish yo'nalishi. janubga yoki shimolga kanallar tahlil qilindi. Shuningdek, Olimlar Leonovning tahlili ma'lumotlariga ko'ra, bu davrgacha bo'lgan iqlim uch marta issiq davrga, uch marta sovuq davrga, ya'ni issiq davrga o'zgargan. davrida daryolar yo'nalishi ekvatorga, sovuq davrda esa shimolga burilgan. Iqlim issiq davrga kirganida, ayrim hududlarni Sarmat va Apsheron dengizlari suv bosganini, buyuk olim Beruniyning daryolar quruqlikka, quruq yerning daryoga aylanishi haqidagi fikri haqiqat ekanini ko'ramiz.

Резюме: В статье анализируется геоморфология Восточного Устюрта, его связь с морями, морской регрессии и трансгрессии. то есть на основании исследований Пинхасова и Леонова, анализировались стратиграфического положения слоев и пород, регрессии и трансгрессии морей, движения рек с севера на юг, с юга на север, т. е. направления поворота русел рек к югу или к северу. Также, на основании данных анализа ученых Леонова, климат до этого периода трижды менялся на теплый период, трижды на холодный период, то есть в теплый период направление рек поворачивалось к экватору, а в холодный период

оно поворачивались на север. Когда климат переходит в теплый период, мы видим, что некоторые районы затопляются Сарматского и Апишеронского морей, и что справедливо мнение гениального ученого Беруни о том, что реки превращаются в сушу и сушу превращается в рек.

Kalit so'zlar: *Ustyurt tizmasi Orol dengizi quruqlik platosi chinni Uchlamchi miqyosdagi karbonat jinslar sharqiy kontinental zaif shakllanish suv oqimlarining janubiy rivojlanishini cheklagan Yura davri muhiti kompleksga ta'sir qilgan sarmat rel'efi umumiy sxemalari stratigrafik tekisliklari Torton ohaktoshlari.*

Ключевая слова: *Устюрт устун Арал Приаралья море земля плато чинка третичными шкала карбонатными породами на востоке континентально слабо формирование ограниченную Южного развития водотоков юрско обстановка подвергалась комплекс влияла сармат рельефа общая схем стратиграфическая равнин Тортонский извесняки.*

AWARENESS AND ACTIVNESS IN MUSIC LESSONS

Azizov O. G.

Termiz State University

Summary: *This article is aimed at revealing the ways of students' better mastering of the lesson and increasing their activity during the lesson in music lessons.*

Key words: *Music lesson, consistency in music teaching, principles of music teaching, awareness and activeness in music lessons.*

INTRODUCTION

The Law of the Republic of Uzbekistan "On Education" and the Law "On the National Program of Personnel Training" and the State Education Standards developed on the basis of these laws require us to teach musical subjects in accordance with the requirements of modern development. Therefore, among all subjects, the teaching of music subjects should be carried out on the basis of a certain procedure, and the continuous continuation of its teaching process is reflected in the law. Therefore, it is necessary to select children according to their interests and create the necessary conditions for them to improve their knowledge in this field in the future. In our opinion, the most optimal way to solve the problem is for teenagers who have been interested in the field of music since childhood and decided to choose it as their profession to enter secondary special educational institutions in the field, thereby having the opportunity to become qualified specialists in the future. In these mentioned parts of the educational system, it is envisaged to develop the scope of knowledge given in all types of activities, from simple to complex, according to the characteristics of children's age. We envisage a general commonality, complementarity, enrichment between the curricula of preschool educational institutions and secondary schools, the latter being a direct successor of the former in all types of musical activities.

It is necessary to develop a certain order of teaching musical subjects for all links of the educational system based on the principle of simple to complex, and in this regard it is necessary to avoid interruptions or repetitions. As an exception, it should be said that when children move from one stage to another, from one class or one group to another, previously acquired knowledge, skills and abilities can be repeated only for the purpose of strengthening. The second problem is about pre-school education, and according to our analysis, only a certain part of preschool children in our Republic is involved in pre-school educational institutions. There is a big difference between the worldview, knowledge, skills and qualifications of children who have not passed the educational stage in these institutions, and this situation creates an imbalance in the acquisition of knowledge and skills provided by the primary school curriculum of general education schools. It should be said that in the present period, the educational programs developed based on the requirements of the time and SESs (State Education Standards) are relatively complex, and they become more and more complicated with each grade. As a result, a child who has not received pre-school education has difficulty mastering subjects. Educated children can read, write, count, draw, even speak foreign languages, as well as their musical literacy, performance skills, and musical outlook are radically different from those of uneducated children.

Today, the future of our great republic depends on an educated and spiritually healthy generation. That's why in his speeches, the President always pays special attention to the education and formation of the spirituality of our youth. For this, they need education and training. Meaningful and continuous educational activities in a noble environment can prevent some immoral behavior in children. In this regard, education of sophistication given to elementary school students is of particular importance. Refinement education consists in teaching children to love and enjoy beauty. Beauty and refinement are present in every song, picture, environment, inner and outer appearance of a person, even in the work process. It is important to have the ability to understand

and enjoy it. Each lesson should be organized on a scientific basis with its structure and content. The scope of knowledge in music is the main factor of music education and upbringing. It reflects the rules, conclusions, and generalized musical experiences of music created by mankind. To improve them means to acquire knowledge and skills in the way of musical practice. The scientific principles of the lesson are the correct teaching of development concepts, the analysis of works in accordance with the intellectual abilities of children. It is necessary to implement science without systematicity. All the learning activities of the lesson and the logical beginning of the next lessons form the basis of systematicity. Each activity of the lesson is a logical continuation of each lesson, and the gradual implementation of pedagogical goals means the principle of continuity. Musical perception enriches a person's life experience, makes real reality artistic, and increases the ability to know and think. The formation of skills and knowledge requires a long process of development of the child's mind. For this purpose, it is necessary for the child to consciously master the learning materials and create the activity of the learning process. Being able to master a certain piece of music by singing or choosing it and perceiving it with artistic and aesthetic pleasure, drawing the child's attention first of all and arousing curiosity in him creates awareness and activity. Conscious perception of music, in turn, requires stable memory in terms of artistic melody and logic. Consciousness and activity in music lessons are especially necessary for the formation of vocal and choral skills. Singing in a choir, listening to music, harmony and activity in music literacy activities make it easier to learn and master the theoretical and practical aspects of music. In the analysis of the work, the melody is played as an exhibition. The teacher himself, his speech, performance also serves as the main exhibition. In addition, technical tools, display cards, graphic records, pictures, sheet music also play an important role as an exhibition in a music lesson.

The principle of matching knowledge and skills. It is used in the process of creating the content of the lesson based on the study materials selected from the program and these methodical materials. It is necessary to take into account the general knowledge and skill level of each class. Based on the program, an annual calendar-theme plan is drawn up, taking into account the knowledge and skills of each class. Consolidation of knowledge and skills in music lessons. The main condition for the implementation of the principle is to strictly follow the four principles described below.

First of all, it is necessary to ensure the depth, stability and vitality of knowledge and skills, that is, children should be inspired by the fact that this work and its performance methods are necessary for our cultural life.

Secondly, a) Suitability of the work for artistic and moral education of children.

b) Nature of music education.

v) To be able to interest all the children in the class in this work and achieve full mastery.

Thirdly, It is necessary to repeat and strengthen the range of knowledge and skills acquired in the lesson in practice. For example: Learning songs in sentences and repeating them in subsequent lessons.

Fourthly. In the music lesson, each new element of knowledge is fully used in the lesson and becomes a permanent knowledge in the following lessons.

In short, the general didactic principles of pedagogy are of great importance in music culture classes and are of great importance in connecting music with life.

Based on the social needs of society, education changes and improves according to the achievements of pedagogic theory and practice.

These principles are mainly divided into several types, determining the use of educational materials, the content of the music lesson and the main requirements of the lesson system and its directions:

1. Consolidation of knowledge and skills in music lessons.
2. Scientific systematicity and continuity in music education and training.

3. Awareness and activity of students in class

4. Demonstration in music lessons.

Educational materials are used in the process of drawing up a plan of children's knowledge-skills and age characteristics. The practical application of theoretical knowledge and the connection of theoretical knowledge with practical knowledge should be felt in the information of every teacher. In the course of the lesson, the compatibility of the educational materials with the children's knowledge experience, taking into account the laws of development of the voice, teaching the laws of notes, the studied works become more and more serious in terms of genre, size and artistic content is called the principle of systematicity.

Music lessons include basic musical activities such as singing in a choir, music literacy, and listening to music. Attention is paid to the main activities of the lesson without separating them from the logical integrity of the lesson. This is called the principle of continuity, that all musical activities in the lesson are carried out independently.

Implementation of the principle of awareness and activity in education is fully based on the psychological foundations of the cognitive process. Although the order and rules are well understood, in some cases students may have difficulties in the process of direct application of knowledge. In order for students to be able to use the acquired knowledge in practical life, it is necessary to turn the teaching process into an active thinking process. Conscious perception of music, in turn, requires artistic tone and logical retention in memory. Awareness and activity in music lessons are especially necessary for the formation of vocal and choral skills. Pedagogical scientists emphasize that a person is a biosocial being, and his social essence is knowledge. Music education, like all subjects, has its own specific scope of knowledge, which students accumulate knowledge reserves in the course of their studies, based on their ability. When we think about the main task of pedagogues who teach music today, the personal social qualities of the teacher-teacher, based on the demands of the times, the demands placed on the pedagogue are gradually improving. First of all, we need to take into account the opinions of our ancestors. In particular, Avesta, the sacred book of the Zoroastrians, which originated in the ancient Turkish land of Khorezm, says: "The duties of teachers-priests are knowledge. it is to educate to distinguish between good and bad and guide to the right path. It is written: "Noshud, a bad teacher destroys the craft from the student's heart, O Yazdon, protect yourself from a bad teacher."

About the responsibility and duty of the teacher, the great scholar Ibn Sina sets the following requirements:

- Being strict and serious in dealing with children;
- to pay attention to the practitioner in how the students assimilate the given knowledge;
- use of different methods and forms in education;
- knowledge of students' memory, ability to acquire knowledge, personal characteristics;
- ability to be interested in science;
- distinguish the most important of the given knowledge;
- providing knowledge in accordance with the age and intellectual level of students;
- it is necessary to reach the level of awakening children's feelings of each word. 2

Pedagogical scientist B. Ziyomukhamedov in his book "Pedagogy" made the following conclusion about the social qualities of a teacher based on the opinions of Eastern scholars and Western pedagogues:

1. A teacher should know well the role, history, basic concept, rules and principles of the subject he teaches in the life of society. It is necessary for him to thoroughly understand the theoretical foundations of pedagogy and his discipline, i.e., didactics. He should be able to apply the knowledge given in "General pedagogy" and "Special pedagogy" to his life and practice. It is necessary to master the forms and methods of teaching and education and be able to apply them in practice.

2. It is important that music pedagogues of higher education institutions not only provide students with knowledge of the basics of their subject, but also prepare them for their future profession, that is, the profession of music teacher. Professional requirements for a future music teacher require the formation of the following qualifications: to be able to sing in a pleasant and bright voice, to be able to use academic singing and folk traditional singing styles; able to skillfully play one of the tunes of Uzbek folk instruments, which are convenient for both teaching songs to students and relaxing music by playing alone; to have thorough knowledge of music theory, to carry out "Master-student" traditions based on notation - in a professional manner; to be able to manage the performance of his students through conducting elements; to be aware of the elements of solfeggio, to be able to sing and play according to the notes; to be aware of choir and ensemble skills and be able to manage them; to have thorough knowledge and skills in teaching methodology; to have the skills to engage in scientific research; have pedagogical sensitivity; being able to establish pedagogical communication; have organizational training.

It is worth noting that, taking into account that the scientific potential of a music teacher is only two to three times more thorough than the level of knowledge of students of general secondary education or secondary vocational colleges, the knowledge given to them should be extensive and thorough. In the years of independence, comprehensive and very important in the Republic of Uzbekistan social, economic and political changes took place. In particular, it can be seen that a number of positive works have been carried out in the field of public education, as well as in other areas. In order to ensure the practical implementation of normative documents such as "Law on Education", "National Program of Personnel Training" adopted on the development of the public education system, the concept of teaching in all academic subjects was developed based on the principles of democratization, individualization of education and taking into account its specific features. In addition, the teaching concept of the music subject was adopted, and the task of further improving the quality of music culture classes in general education schools was set.

In the current theory and practice of school activity, there are many options for implementing new ways of the educational process and conducting it. Each author and practitioner contributes their individual contribution to the pedagogical process. But many new technologies are characterized by these common features of having enough similarities in terms of their goals, content, methods and tools used: according to the level of use; on the philosophical basis; on the main development factor; on the concept of mastering; according to the orientation according to the qualities of the personal sign; according to content characteristics; By type of management; On the approach to the child; on the methods used; By categories of learners.

It can be described according to the directions above: according to the level of application: general pedagogical; in terms of the developmental factor, the main focus is on the education of well-rounded people who are active participants of the society; on the concept of mastering; associative; reflective, relying on suggestion (example, example, example); According to the orientation according to the qualities of the personal sign; informational, i.e. aimed at forming and strengthening the knowledge, skills, and abilities of a person; according to the characteristics of the content: secular, technocratic, in the content of general education, didactics is given a central place in the organization and conduct of activities in the educational process; according to the type of management: traditional-classical (classical), with the addition of technical means of education; according to the approach to the child: authoritarian; on commonly used methods: explanation and illustration; by categories of learners: public and others.

Such opportunities of musical art in educating the new generation for their well-rounded personality. The subject of musical culture is connected with all subjects taught in general secondary schools, including literature, visual arts, physical education, labor and other subjects. Along with all educational subjects, music education has also introduced SES, and it has been given the opportunity to make full use of the national musical heritage. The practice of folk tunes and

songs is reflected in the creative activities of singers and musicians in the themes of status, Shashmaqom, epics and modern music. Learning to listen to music is more complicated than learning to sing. (for example: symphonic music, opera, etc.) it is necessary to introduce students to the high artistry of music. Such works broaden students' worldview and educate their musical taste. In order to educate a large number of literate listeners, it is necessary to teach musicians from childhood to understand and love music. Loving music means listening to music all the time and consciously perceiving it.

As the President noted, the young generation will convey our culture and spirituality, the intellectual values of development to the minds of the members of the future society. After all, in the conditions of building a legal democratic state and civil society, the formation of a new thinking person is important. At this point, the role of our national music in the spiritual upbringing of young people is of particular importance. Because the national music art has its role in preserving the values inherent in the national mentality of our youth. It is known that our national art of music serves to increase sincerity and mutual kindness among young people. The meaning and essence of musical education lies in the upbringing of a perfect generation, a perfect person. In fact, it is becoming more and more clear how important a factor musical education is in the upbringing of the young generation. Therefore, we should try to encourage the young generation to study our rich musical heritage, to avoid light-hearted and dull tones, to raise their artistic taste, musical culture, and expand their spiritual world. In this regard, along with the unique masterpieces of our national heritage such as "Shashmaqom", we need to teach and explain the masterpieces of world-renowned great composers such as Mozart, Beethoven, Bach, Tchaikovsky, Rachmaninoff, Khachaturian.

CONCLUSION

In short, the general didactic principles of pedagogy are of great importance in music culture classes and are of great importance in connecting music with life.

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Rezyume: Mazkur maqola musiqa darslarida o'quvchilarning darsni yaxshi o'zlashtirishi va dars davomida faolligini oshirish yo'llarini ochib berishga qaratilgan.

Резюме: Данная статья направлена на раскрытие путей совершенствования обучения и активности учащихся во время урока на уроках музыки.

Kalit so'zlar: Musiqa darsi, musiqa o'qitishda izchillik, musiqa o'qitish tamoyillari, musiqa darslarida onglilik va faollik.

Ключевые слова: урок музыки, последовательность в обучении музыке, принципы обучения музыке, осознанность и активность на уроках музыки.

**INTERDISCIPLINARY INTEGRATION IN THE FORMATION OF PROFESSIONAL
COMPETENCE OF THE FUTURE TECHNOLOGICAL EDUCATION TEACHER**

Saparniyazova Z.M.

Karakalpak State university named after Berdakh

Summary: *This article is dedicated to revealing interdisciplinary integration in the formation of professional competence of the future technological education teacher .*

Key words: *pedagogy, professional competence, integration, communication, creativity, technological, practical, design, technological map, product.*

INTRODUCTION.

Today, the changes in the educational process require the formation of the most modern pedagogical technologies, the directions and needs of the teachers of education in accordance with the international educational standards, taking into account the demands and needs of the teachers, economic sectors and the prospects for the complex development of the regions. is doing. These changes make it important to prepare competitive future teachers who are active in society, creative and proactive, who can quickly learn new things about the world, and who have professional qualifications.

Interdisciplinarity in education is the use of knowledge and skills acquired in mastering one subject to apply another subject. A student who has the necessary knowledge of different and interrelated disciplines, when creating a technological map of a product, consciously chooses the most appropriate one, taking into account the physical and chemical characteristics of each detail. It is a complex multifaceted process of synthesis of knowledge through objectively existing h odica-analysis of knowledge and practical actions. The student is required to creatively process the knowledge, arguments, concepts and calculations known from courses in other subjects necessary to solve the problem of practical knowledge development. Comparison, analysis and generalization of the necessary information and actions lead to the formation of elements of creative research, to the selection of rational ends of the work. Making interdisciplinary connections between applied sciences, these are the common ends of graphic activities used to solve common problems.

“Interdisciplinary Relations” understanding is a cof pedagogical term. According to a number of authors, it serves as one of the principles of didactics, is an expression of the existing laws of the objective world, and due to its philosophical and didactic meaning, it affects the structure, ends and form of teaching in a certain way. This exchange is so wide that it is useful not only in the teaching of all subjects of the faculty, but also in the preparation of textbooks, methodical manuals, and in general education and development of students. Researchers identify interdisciplinary relations as one of the principles of didactics and include them among the well-known principles of didactic teaching.

Interdisciplinarity is divided into the following components:

- subject-related integration - the representations of the same subject from different disciplines are included in one topic, section or courses; Conceptual integration involves covering topics or courses that reveal the content of common concepts;
- in theory integration, theories in physics, chemistry and biology are studied in general;
- methodological integration involves integration of separate methods of scientific knowledge; in problem integration, interdisciplinary problems are covered and solutions are developed;
- in the integration of activities, it is envisaged to hold a discussion on problem solving, work in small groups, make a plan of interdisciplinary activities, prepare projects, etc.;

- practical integration involves the creation of technical products based on important processes.

and unrelated knowledge can not be called systematic in the full sense. In this way, the system is considered as interrelated internal knowledge not only in the scope of one science, but also in a certain cycle of sciences and in the sense of connections between different cycles. Understanding the real system, as well as real knowledge, is not possible without interdisciplinary and sequential communication.

Interdisciplinarity, which acts as one of the didactic conditions for achieving the set goal, realizes understanding. Regular implementation of conscious actions improves knowledge, leads to generalization of practical actions, ability to use knowledge creatively in special conditions. The use of theoretical and practical knowledge leads to the solving of various educational and practical tasks, the formation of common ends of mental activity, and as a result, the quality of knowledge increases with the help of special preparation.

An advantage of interdisciplinary communication is the acquisition of case analysis skills in a comprehensive study from a variety of disciplinary perspectives. This ensures the formation of elements of a creative approach in the performance of the task and later in the professional activity, and the desire to increase knowledge.

If the study of "Technical Mechanics" course includes the interrelated principles of any mechanism, the creation of a technological map for the manufacture of each item considered in the "Technological Education Practicum" course, and an item is made based on this map, the physical properties of each detail should be considered based on the laws of the "Physics" course. If it comes out, it will allow students to better study the product made in the technological process, the knowledge of the students will become more and more reliable and deepen. In turn, this knowledge complements the practical work performed in the training of technical creativity and design science. There are attempts to define the role of interdependence both practically and ecstasically. On the problems of practical and methodological preparation. Until now, a number of studies have been carried out. Such studies were conducted only in the process of training future teachers of technological education of higher educational institutions of pedagogy. In the conducted studies, only the principles of ministerial and practicality were focused on defining the object, but the physical characteristics of each item were not paid attention to.

The relevance of the problem of interdisciplinary relations is related to the integration and differentiation of various disciplines, complex problems, which lead to the emergence of common scientific concepts.

on the most common definitions of integration and differentiation given in the literature. Integration is the aspect of the development process related to the integration of previously scattered elements into a whole. Differentiation is a part of the development process related to the division and separation of a developing whole into parts, branches, and levels. Integration is the leading trend in the development of scientific knowledge in modern conditions. It makes itself invisible in combining and synthesizing previously developed knowledge in the emergence of new knowledge that increases the quality of scientific research.

The integration and differentiation of scientific knowledge is reflected in the structural and procedural aspects of education. The process of integration in educational processes cannot be carried out separately from a well-developed and well-organized interdisciplinary theoretician. At the same time, the theory of interdisciplinarity should be significantly connected and supplemented with a certain educational process for a certain need.

There are different approaches to the classification of interdisciplinary relations in pedagogical literature.

N.A. According to Muslimov, one subject uses the information acquired by the student from another subject. Students must have deep connections between the disciplines being studied as they

work together to create shared, interdisciplinary understandings. It is necessary to develop certain concepts or a group of ideas of one subject in a newly enriched and modified form, complementing other subjects of Dactur, and transfer this knowledge to related academic subjects.

V.N. Makcimova defines three types of communication based on the general composition of educational subjects and the structure of the educational process in the classification of interdisciplinary communication: structural-informational, operational-active, organizational-communal.

The requirements for interdisciplinary communication compiled by M.D. Zverev, V.M. Makcimova, in our opinion, are of great importance for engineering and computer graphics, which are presented together with the rest of the curriculum:

1. An interdisciplinary book should have a clearly expressed educational and knowledge task, and to solve it, it is necessary to involve the knowledge of other disciplines.

2. High activity in the application of knowledge from other disciplines should be ensured in the interdisciplinary course.

3. Implementation of interdisciplinary communication should be aimed at explaining the final relations, the essence of the studied cases.

4. An interdisciplinary book should have a worldview, generalized nature conclusions in order to connect tasks of different disciplines.

5. An interdisciplinary book should arouse the interest and positive attitude of students to study the relationship between knowledge and other subjects.

6. An interdisciplinary book should always be aimed at summarizing some aspects of educational materials of different fields.

In the pedagogical, psychological and sociological literature, the following are the factors that determine the student's readiness, the development of interest in education, and the indicators of studying in higher education : kacb selection cababs; satisfaction with choice; elementary level of preparation.

Turning to the curriculum of the 60112300 – Technological education course, the curriculum consists of blocks of compulsory and elective subjects. In the training of future teachers of technological education, it is necessary to give them practical knowledge as well as methodical knowledge as a provard goal.

In our research work, we will consider the subjects “Technology Education Practicum”, “Physics” and “Technical Creativity and Design” in this curriculum. The subject of “Technology Education Practicum” is taught in the 1st-3rd semesters of this educational field. 120 hours of classes are planned for each semester. It should be noted that practical and independent training sessions in this subject are planned.

Knowledge of physics is definitely required from the student during practical training in “Technology Education Practicum”. Because, during the practical work, the student is required to observe the safety of the equipment in the first place. When performing any technological operation, the student cannot perform practical work without knowing the physical properties of the object he is making, i.e. flexibility, bendability, unity, electrical current conductivity, heat conductivity, or the work he does does not meet the requirements. Therefore, in the curriculum of this educational direction, 24 hours of lectures, 36 hours of practical and 60 hours of independent training are planned in the 1st year of “Physics”.

The subject “Technology Education Practicum” is conducted in the directions of technology and design and service. In the direction of technology and design, students are given the following knowledge: manual woodworking; mechanical processing of wood; manual metalworking; mechanical processing of metal.

In the field of service, excellent students are taught the methods of manual and mechanical processing of gases. In the field of service, students are required to know the properties of each

fabric, the hardness of the equipment, the physical knowledge of the heat and cold conductivity of gases.

In conclusion, it should be emphasized that the graduates of the 60112300 – Technological education course conduct practical training in technology in general secondary schools. As we know, technology science is in the block of applied sciences in the school curriculum. That's why technology students are taught practical work in practical training, as well as aesthetic knowledge. At first, students make simple items by manual methods, then in the upper grades, they are taught to make items by working with modern equipment, tools, machines, and machines. In making every item, it is necessary to rely on physical laws.

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Rezyume: *Mazkur maqola Bo'lajak texnologik ta'lim o'qituvchisining kasbiy kompetentligini shakllantirishda fanlararo integratsiyasini ochib berishga bag'ishlangan.*

Резюме: *Данная статья посвящена выявлению междисциплинарной интеграции в формировании профессиональной компетентности будущего учителя технологического образования.*

Kalit so'zlar: *pedagogika, kasbiy kompetentlik, integratsiya, aloqadorlik, ijodkorlik, texnologik, amaliy, dizayn, texnologik xarita, buyum.*

Ключевые слова: *педагогика, профессиональная компетентность, интеграция, коммуникация, творчество, технологический, практический, дизайн, технологическая карта, предмет.*

OPPORTUNITIES FOR THE USE OF DIGITAL TECHNOLOGIES IN THE TRAINING OF FUTURE TEACHERS OF TECHNOLOGICAL EDUCATION

Allamurodov A.A.

Termez State Pedagogical Institute

Summary: *This article deals with revealing the problems and their solutions and opportunities in the use of digital technologies in the training of future technological education teachers.*

Key words: *pedagogy, higher education institutions, technology, digital technologies, method, problem, solution, constructive activity, creativity, object.*

INTRODUCTION

The changes taking place in the social, economic, political and ideological life of our republic, that is, the rapid development of science and technology and many other factors necessitate a radical reform of the system of continuing education, including the process of teaching students at the University on the basis of the requirements of the time.

In the development strategy of the Republic of Uzbekistan for 2022 - 2026, it is noted that the education system is the main priority areas for the formation of a new generation of personal with a common and professional culture, able to think correctly in socio-political life, have professional skills, are able to perform promising tasks on the basis of World achievements [1]. Professional training of future teachers of technology, education of students in general secondary schools in the spirit of love for the motherland, loyalty to the ideas of national independence, creation of conditions for their conscious and independent professional choice create conditions for the implementation of effective tools and methods of vocational guidance work and entrepreneurship, training of pedagogical personnel in new professions and specialties related to the development of small and medium-sized businesses is today one of the main tasks of higher educational institutions. Because, the role of specialist teachers teaching technology in the departments of professional people who serve conscientiously is great for students of general secondary schools to find their place in society, actively participate in life [2].

On the problems of improving the training of teachers of technology and vocational education A. I. Avazbaev, S.Ahmadaliev, L.R.Zaripav, N.A.Moslimav, B.U.Alimov, A.Parmanav, Sh.S.Sharipov, B.E.Kadirav, F.X.Mokumava, S.S.Igamov, M.X.Ikramova, A.H. Research work was carried out by Sadigova and many other scientists of our country.

The analysis of research on improving the process of training future teachers of technological education in pedagogical higher educational institutions (PHEI) and the results of our practical work experiments showed that the following plays an important role in this regard: Development of theoretical foundations for the use of digital technologies in the professional training of future teachers of technological education in PHEI; determination of the level of access of future teachers of technological education to digital technologies and its development; development of educational tools based on digital technologies in teaching specialized disciplines; development of methodology for the use of digital technologies in the development.

And for this: a platform of information about the practical importance of innovative technologies and the ability to improve it on a regular basis; to have didactic laws that correspond to the professional activities of teachers of digital technologies; to have a database of relationships with technical means (details, devices, mechanisms, compounds, machines, etc.) belonging to different professions and be able to use them as educational information when conducting professional activities (using knowledge, skills and abilities in practical activities); to study the scientific and theoretical foundations of didactic tools; in design work, it is necessary to have practical competencies (be able to read, Make a technological map and make changes to a

technological map) in the process of making items on the basis of technological maps of objects; to have knowledge and skills related to handicraft work (Technologies for processing household items, electrical work, polymer materials) necessary in everyday life in preparation for [3].

The acquisition of the knowledge and skills described above plays an important role in the upbringing of young generations who are stepping into a big life. In the education of the younger generation as comprehensively educated and competitive personnel, high requirements are imposed on the professional knowledge of today's teachers [4,5]. The professional knowledge of teachers is as follows: knowledge of the psychology of the student; love of students; circulation based on the psychology of the student; deep knowledge of one's own science; requires knowledge and ability to apply the latest information and communication technologies in practice. This leads to an improvement in the use of digital technologies and creates opportunities for acquiring the knowledge necessary in professional activities.

We have identified topical issues that need to be resolved in the professional training of potential teachers of technological education.

These are: to introduce the use of digital technologies in the process of professional training of future teachers of technological education, to determine the level of development of competencies and abilities of students to be able to apply digital technologies in their future professional activities; to scientifically substantiate the important importance of future teachers of technological education as mature specialists who meet the requirements; organization, conduct and practice of pedagogical experience-testing activities that determine the level of acquisition of sufficient knowledge, skills and abilities of future teachers of technological education on the use of digital technologies. Due to the rapid development of Science and technology, the content of competencies that the future teacher of technological education preparing for POTMS should have is constantly improving [7]. This, in turn, suggests that future teachers of technological education should have knowledge, skills and abilities that allow them to effectively use information and communication technologies in their future professional activities. In a word, having the competencies of the effective use of information and communication technologies as a didactic tool in the training of future teachers of technological education serves as one of the important factors in increasing the effectiveness of the quality of education given to future specialists. However, an analysis of the existing pedagogical experiments in the application of information and communication technologies to the process of training future teachers of technological education showed that there are the following problems and disadvantages in this regard: insufficient readiness of some professors and teachers who are teaching students of the technological direction of their potential, to apply digital technologies in the process of; In PHEIs, there is a lack of digital technologies that allow students of the technological direction of education to carry out design activities in the educational process using digitized educational tools, the absence of methodological support for their practical application.

In the organization of theoretical, practical, seminar and experimental classes in the disciplines of the curriculum, it is important to develop substantive structures of connection with theory and practice, introduce them into practice, individualize independent education in the audience and outside the audience, develop distance learning tools, improve the acquisition of modern knowledge of students using a modular educational system based on innovative pedagogical syllabus.

In the process of technology education, physical activity is accompanied by mental activity, which allows students to design items, develop technology for their preparation and solve a number of other creative tasks. Thus, technology education is carried out along with thought activity, which allows the mental development of future students of Technology Science. Today, the following imbalances and contradictions are noticeable in the professional training of the future teacher of

technology in solving his scientific, theoretical and practical, material and technical, socio-pedagogical problems, reforming its traditional content:

The imperfection of the complex provision of the science of technology at the level of scientific-methodological, pedagogical and material-technical perspective requirements carried out in general secondary schools with the changes taking place in the socio-economic and political sphere [4]; scientific-technical and creative circles, advanced production technologies are not sufficiently reflected in the modern economy and new forms of economic; the science of technology in the content, purpose, form, means and methods of the present day does not reflect the national ethnic, territorial-historical characteristics of the Republic and the criteria of oriental thinking; given the peculiarities of technology education, the insufficient development of the pedagogical, and psychological, didactic foundations of the mechanisms of its implementation; the imbalance of the professional qualifications of pedagogics in Higher educations.

The aforementioned shortcomings and contradictions are the main reasons that lead to the need for a radical update, reform of technology education. The observations made have shown that at present there is not enough attention of students to technological education in the system of general secondary schools of our republic. The main reason for this is the inability of the younger generation to satisfy their demands and interests, as the existing programs of preparing students for labor are growing in current conditions.

When implementing reforms in the main areas of development of Technology Science, the following conditions should be created: teaching the organizational, economic, technical and technological foundations of the production of material goods in the educational process; introducing sections in the content of professional directions, information on modern techniques and technologies into educational programs for the development of creative abilities and independence of students; ; improving the material and technical support of technology education.

In the elimination of the existing theoretical and practical, social, pedagogical and material and technical problems of technology education in general secondary schools, as well as in the preparation of students for life and profession in a new society, in the formation of knowledge, skills and abilities about modern areas of professionalism in students, of course, the preparation of the future teacher of technological education.

The use of digital technologies in the educational process is a phenomenon corresponding to full-fledged legality. Only the effectiveness of their use in education is associated with a clear idea of problems that occur between teacher-student. The substitution of complex interactions, arising in the system of teacher-student interaction. Digital technologies radically differ in the content and Moss of education, create the basis for the development of new generations of its innovative methods, forms and means. The essence of the content and methods of application of these ideas are covered in the next paragraphs of the dissertation. The convenience of implementing digitized education is that at the time of the wrong answer to the test question, the student has the opportunity to re-enter the task by taking additional information from the developed information and educational environment.

Since one of the priority tasks in the work of applying digital technologies in the preparation of future teachers of technological education for professional activities is associated with the assimilation and processing of new information, the application of computer and mobile tools as a didactic tool providing information to this process is of particular importance [3]. As you know, computer and mobile devices work as a device for collecting, storing, processing and transmitting information.

The question of its importance in the implementation of the process of preparing future teachers of technological education for professional activity can be answered as follows: by means of a complex of internal capabilities of computer and mobile means of communication, it provides an opportunity for a full-fledged development of personal abilities to the educator. Today, it will be

necessary to expand the modern knowledge of educators, to conduct small studies, to help them find opportunities and their place in life, creating an educational subject-subject environment, not limited to teaching in educational and educational subject-object relations. As a result, the educator collects the data and ensures that the subordinate to the machine as a existence remains the manager of the entire process, and not the creature.

CONCLUSION

In this sense, digital technologies change the way of life and the form of labor of all mankind, providing it with ample opportunities to deepen its knowledge, improve its skills. As a result, the educator collects the data and ensures that the subordinate to the machine as a existence remains the manager of the entire process, and not the creature.

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Rezyume: *Mazkur maqola bo'lajak texnologik ta'lim o'qituvchilarini tayyorlashda raqamli texnologiyalardan foydalanishdagi muammolar va ularning yechimlari hamda imkoniyatlarini ochib berishga bag'ishlangan.*

Резюме: *В данной статье речь идет о выявлении проблем, их решении и возможностях использования цифровых технологий в подготовке будущих учителей технологического образования.*

Kalit so'zlar: *pedagogika oliy ta'lim muassasalari, texnologiya, raqamli texnologiyalar, metod, muammo, yechim, konstruktorlik faoliyati, ijodkorlik, buyum.*

Ключевые слова: *педагогика, высшие учебные заведения, технология, цифровые технологии, метод, проблема, решение, конструктивная деятельность, творчество, ст.*

EPISTEMIC MODALITY IN ENGLISH AND KARAKALPAK LANGUAGES

Khudaybergenova Z.O.

Karakalpak State university named after Berdakh

Summary: *In this article, epistemic modality is studied comparatively in English and Karakalpak languages and this is one of the actual problems to learn. Types of epistemic modality are learnt in these two languages through the views of scholars. As a result, it was found that in these two languages modality has similarities and differences too.*

Key words: *modality, epistemic, deontic, necessity, possibility, certainty, evidentiality, judgement, speculative, deductive and assumptive.*

In modern English linguistics the term modality has been studied extendedly by several authors as P. Portner, F. R. Palmer, J. Coates, J. L. Bybee, Fleischman and others. In Karakalpak language the views related to the modality has been mentioned as a separate part in “Хәзирги қарақалпақ әдебий тилиниң грамматикасы” by Bekbergenov A. et. al, “Хәзирги қарақалпақ тили. Морфология” by Nasirov D. et al. and other scholars’ works.

Linguists in both languages learn modality in different ways, classifying it differently. In English language, P. Portner suggests three primary categories of sentential modality: epistemic, priority, and dynamic [1] Downing and Locke [2] note that modality is understood as a semantic category, which covers such notions as possibility, probability, necessity, volition, obligation and permission. In the latest researches, the concept of modality has been enlarged with other notions like doubt, wish, regret and desire. The modality is differentiated into two main types: Epistemic Modality and Deontic Modality and the first type is studied comparatively with Karakalpak language in this article.

Epistemic modals are those concerning to the speaker’s knowledge. According to Griffiths’s theory, Epistemic interpretations have to do with knowledge and understanding. Markers of epistemic modality are understood as qualifications proffered by speakers or writers (or from someone they are reporting) regarding the level of certainty of a proposition’s truth. [3]. It deals with the necessity and possibility of a suggestion when there is obvious fact. Consequently, epistemic modality is obtained from the fact that can be true from reality. It indicates how much certainty or evidence a speaker has for the proposition or suggestion expressed by his or her discourse. For example:

If Peggotty were looking for a hole, all of a sudden, in the heel of that stocking, it must have been a very little one indeed, and not worth darning. (Ch. Dickens “David Copperfield” p. 43)

With epistemic modality speakers express their judgements about the factual status of the proposition. Palmer divides this judgement into three as speculative, deductive and assumptive. [4].

I may be excused for calling, that eventful and important Friday. (Ch. Dickens “David Copperfield” p. 11)

In this example a possible conclusion is meant by using modal word *may* and labelled as a speculative type of epistemic modality.

I took the opportunity of asking if she was at all acquainted with Mr. Brooks of Sheffield, but she answered No, only she supposed he must be a manufacturer in the knife and fork way. (Ch. Dickens “David Copperfield” p. 41)

By this example one can understand the only possible conclusion which is labelled as a deductive epistemic modality.

‘Barkis will be so glad,’ said Peggotty, wiping her eyes with her apron, ‘that it’ll do him more good than pints of liniment. (Ch. Dickens “David Copperfield” p. 460)

In this example by using will the speaker expresses a reasonable conclusion and it is labelled as an assumptive epistemic modality.

According to Zhang's research on modality Epistemic modality is different from logical modality which always can be true in any case. Epistemic modality is further divided into two subcategories, viz. epistemic necessity and epistemic possibility. Epistemic necessity cannot always be true though it comes from real knowledge of the world. Epistemic possibility, on the contrary, isn't based on the knowledge of the real world. It only provides one of the possibilities according to the speaker's assumption. [5] For example,

(1) Epistemic necessity:

I must have read very perspicuously, or the poor soul must have been deeply interested, for I remember she had a cloudy impression, after I had done, that they were a sort of vegetable. (Ch. Dickens "David Copperfield" p. 29)

(2) Epistemic possibility:

'Mr. Micawber's difficulties are almost overwhelming just at present,' said Mrs. Micawber; 'and whether it is possible to bring him through them, I don't know. (Ch. Dickens "David Copperfield" p. 238)

In Karakalpak language modality is a grammatical category which expresses various attitudes to the speaker's opinion and its meaning. It includes definiteness, suspense, refusal, prediction, confirmation and other notions. "Component modal words are usually found in the compound predicate and gives different modal meanings to this predicate. They are *керек, зәрүр, тийис, дәркар, шәрт, шығар* and so on". [6]

The component modal words have various types and forms due to their structure and, also meaning.

1) Modal words are used to talk about obligation, things that are necessary to do. These modals are followed by the infinitive. They are *керек, зәрүр, тийис, шәрт*.

Бирак, соны да айтып етиў керек, тарийхшы алымлар да бирин-бири мойынлай бермейди. (М. Нызанов Каракалпақлар)

Бул ушын заманның бағытын билиў зәрүр. Заман қайда баратыр? (Т. Қайыпбергенев Қарақалпақ дәстаны (трилогия) Маманбий әпсанасы)

Соның ушын да бабамыздың өмирдеги алжасығын туўры түсинип, жаманын жасырып, жақсысын асырыўымыз тийис. (М. Нызанов Каракалпақлар)

Маман хан адамы саналып, бий атағын алғаннан кейин қасына жасаўыл ертип жүриўи шәрт. (Т. Қайыпбергенев Қарақалпақ дәстаны (трилогия) Маманбий әпсанасы)

2) When the modal words *мүмкин, итимал* are used with the infinitive forms of the verb, they mean possibility.

Хан болып атырған жайдың есигіндеги адам ишке тез кирип шығып, ханның ўақты жоқлығын, егер жүдә қыстаў, өлимлик иси болса, биреўиниң ғана кирип шығыўға мүмкин екенин хабар етти. (Т. Қайыпбергенев Қарақалпақ дәстаны (трилогия) Маманбий әпсанасы)

Қайсы инсан тәнхә өз өмиринин қыйыншылықларына өзи себепши екенин дұрыс түсинбей, тек айналасындағылардан гұманланып жасай берсе, сонында сөзсиз сатқынға айналғанын өзи де сезбей калыўы итимал. (Т. Қайыпбергенев Қарақалпақпаң. Тәўекелшимен китабынан)

In these two sentences possibility is expressed by using modal words *мүмкин* and *итимал*.

3) When the modal word *шығар* is used with the past participle (with the suffixes –ған/-ген, –қан/-кен, –туғын, –жақ), it means prediction.

Аз деп ойлаған шығар деген ой менен ҳәр сапары жибергенде малдың санын молайтады. (Т. Қайыпбергенев Қарақалпақ дәстаны (трилогия) Маманбий әпсанасы)

«Бәлким, бул қәуим печьтиң устинде жатып уйқылағанды тәўир көретугын шығар» деген қулқили версиялар да бар. (М. Нызанов Каракалпақлар)

Research on modality is closely connected to the possible world. Modality shows the necessity and possibility of the world. This article is aimed to learn comparatively some major aspects of modality such as, epistemic modality and its types, as well as its usage of basic in two languages English and Karakalpak.

Modality is a very important semantic concept that attracts many scholars' interests. A number of studies on modality have been conducted.

To conclude, each language has its own varieties in any linguistic aspect, as well as the structure and usage are different, but studying them comparatively is the best way to learn accurately.

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Rezyume: *Ushbu maqolada epistemik modallik ingliz va qoraqalpoq tillarida qiyosiy o'rganiladi va bu urganish kerak bo'lgan dolzarb muommalardan biri. Epistemik modallikning turlari mazkur ikki tilda olimlarning qarashlari orqali o'rganiladi. Natijada bu ikki tilda modallikning o'xshash va farqli tomonlari ham borligi aniqlandi.*

Резюме: *В данной статье эпистемологическая модальность сравнительно изучается в английском и каракалпакском языках, что является одной из актуальных проблем для изучения. Типы эпистемической модальности изучаются на этих двух языках через взгляды ученых. В результате было установлено, что в этих двух языках модальность имеет как сходства, так и различия.*

Kalit so'zlar: *modallik, epistemik, deontik, zarurat, imkoniyat, aniqlik, dalillik, hukm, nazariy, deduktiv va tahmini.*

Ключевые слова: *модальность, эпистемологический, деонтический, необходимость, возможность, определенность, доказательный, суждение, теоретическое, дедуктивное и предполагаемое.*

**IMPROVING STUDENTS' INTERCULTURAL COMMUNICATION THROUGH
LEARNING ENGLISH**

Arzieva B. A.

Nukus state pedagogical institute

Summary: *The article deals with the problem of developing the intercultural competence of students by means of the subject "Foreign language" based on the implementation of the linguistic and cultural approach. This article can be based on how students from different educational backgrounds, experiences, opinions and context deal with different aspects of the target culture and what values they allocate to the target culture as part of the foreign language study.*

Key words: *EFL, diagnostic, life, formative, milestones, culture, literature, history, architecture, interculture, British/American culture, through education, art.*

The essence and scope of this topic is so wide, especially in the era of globalization, the importance of intercultural dialogue is very important. In the novelty of this work, this study combines English and Uzbek cultures in interconnected social, political, economic and cultural spheres, analyzing them scientifically, practically and theoretically, as well as in all spheres of society.

This approach provides language learning in close connection with the foreign language culture, which includes a variety of informative information about the history, literature, architecture, life, manners, lifestyle and tradition of the people of the country of the target language. There were used a complex variety of research methods: analysis of pedagogical, methodological and psychological literature on the issue of research, monographic method of research solid experience of teaching a foreign language in secondary school; method of observation, conversation; study of products of educational activity of students of pedagogical experiment (diagnostic, formative, milestones). In the framework of the implementation of the experimental work on the control phase revealed the results the development of intercultural competence of students by means of language culture in the middle phase of learning. [1; 57-64]

Sometimes, filling our students up with all the requisite grammar and vocabulary, and polishing their pronunciation and honing their communicative skills doesn't actually seem to be helping them to achieve the wider goal of being able to genuinely communicate with and understand the real world outside the classroom at all.

The source of the information is wide, clear and mainly to increase cultural knowledge and the role of intercultural communication in all spheres of society and in the whole world, as well as in the process of globalization and intercultural communication information on how to communicate in a leading way.

For too long, we have been concentrating on structures and forms and producing materials that may help our students to have perfect diphthongs or a flawless command of the third conditional while leaving out anything approaching real, valid, meaningful content.

What is intercultural learning? The process of becoming more aware of and better understanding one's own culture and other cultures around the world. The aim of intercultural learning is to increase international and cross-cultural tolerance and understanding. This can take lots of forms - intercultural learning is by no means only a part of EFL, but has exponents in all fields of education. What do we understand by the word 'culture'? A way of life. A set of social practices. A system of beliefs. A shared history or set of experiences. A culture may be synonymous with a country, or a region, or a nationality or it may cross several countries or regions. A culture may be synonymous with a religion, though followers of Christianity or Judaism or Islam may also

come from different cultures. It is highly possible to belong to or identify oneself with more than one culture. [2; 328]

Language itself is defined by a culture. We cannot be competent in the language if we do not also understand the culture that has shaped and informed it. We cannot learn a second language if we do not have an awareness of that culture, and how that culture relates to our own first language/first culture. It is not only therefore essential to have cultural awareness, but also intercultural awareness. Intercultural communicative competence Following on from what Kramsch says above, intercultural awareness is not really therefore a skill, but a collection of skills and attitudes better thought of as a competence. Intercultural communicative competence is an attempt to raise students' awareness of their own culture, and in so doing, help them to interpret and understand other cultures. It is not just a body of knowledge, but a set of practices requiring knowledge, skills and attitudes. Nowadays, schools are becoming increasingly diverse, both culturally and linguistically. As a result, teachers need to be more cross-culturally competent.

When developing learning aims, take into account students' cultures, facilitating opportunities for all kinds of students. It is important to pay special attention to those students who differ in race, ethnicity or religion, in order to promote the same learning opportunities. Only by taking into account all these factors will we find the best way all learners can achieve their aims.

Keep students actively involved in the lessons and try to work in cooperative learning groups, empowering them to participate more fully. Cooperative groups help learners develop their interpersonal and intrapersonal intelligence, and strengthen their social skills and their empathy towards their classmates. These cooperative groups have proven to be more effective in working through projects, as the burden of the learning process is on learners, and it brings teaching from abstract knowledge to real world application. Moreover, working on projects provides a framework for creating classes that are interesting and address students' needs. [3; 185]

Build relationships with students and their parents. We must show them we care by getting to know their individual needs and strengths and sharing their problems, joys and hopes. Students must feel that they belong and are accepted. Understanding our students' lives will enable us to enhance the significance of lessons and will make examples more meaningful. If we get parents to be involved in different activities, learners will achieve the aims more efficiently.

Maintain high standards for all students. Thus, they will be challenged and their learning will accelerate, regardless of their backgrounds. It is clear that students learn more if they are challenged by teachers who have high expectations for them. Therefore, it may be useful to involve students in problem-solving activities, where they are required to use analytic skills and make connections.

As it was given above there are various elements of culture that can be based on improving intercultural awareness. In this part we are going to illustrate some ways of how to use it in English Foreign Language classes. The two basic methods are the most appropriate in our research to analyse and show student's intercultural awareness. The questionnaire and Interviews are used in order to illustrate cultural skill of students and also to examine how students from different backgrounds perceive, think and practice different aspects of foreign language culture. Concerning the need to investigate culture and culture teaching in different context of foreign language teaching, this study offers an original aim by comparing and contrasting students of different educational backgrounds rather than cultural backgrounds to answer the following research questions. Now we talk about this question. [4; 100]

Thus, in the process of communication, communicative (information), interactive (interaction) and perceptual (interaction) perception takes place. The communicative side of communication is the exchange of information between the participants, the interactive side is the interaction of the participants, and the perceptual side is the way the participants understand and know each other in the process of communication.

Communication is the main form of interpersonal relationships, through which people interact with each other spiritually, exchange information, interact with each other, feel and understand each other. Therefore, communication as a socio- psychological phenomenon occurs in all spheres of social life, as a need for material, spiritual, cultural, emotional, motivational aspects of cooperation. At the same time, one of the main tasks of the research is to develop a system of intercultural communication competence, generalizing culture, language and communication, deeply studying the specific features of the cultures of many peoples reflected in the social, political, economic and cultural spheres of society.

Intercultural dialogue is leading in the current era of globalization, especially in all spheres of society, with its important indicators. Just as every field in society has its own sphere of communication, so in the process of teaching English, the proper use of communication, that is, communication in English, is important in oral and written communication. Because every word in a language has its own lexical meaning, they are expressed differently depending on place, time, space, direction and methods. In this context, there are different ways, principles, tools, directions and approaches to developing intercultural communication competence. For example, through education, art, literature, sports, and other areas that are part of culture, it is possible to develop intercultural communication competence in students' minds, both orally and in writing. Because culture is a very broad concept, it includes a number of areas, industries, programs, and all areas of society.

The findings of the study have showed that both groups of students are generally aware of their pittance of teaching and integrating culture in the foreign language classroom. In addition, in teaching English language, teachers' basic purpose to teach culture is to develop fairness, honesty, patience, charity and tolerance towards the target culture.

They believe that giving, teaching and familiarizing students with the daily lives of the target culture may cover the way to an understanding of the target culture and its traditions, identities, rituals, customs, stereotypes, perception, life styles, values and norms. Such comprehension is also seen as a way to permit students to explore the varieties of their own culture and the diversity within their culture. This attitude is in accordance with what culturally responsive teachers do in the classroom. They use the culture as a tool to highlight the differences and similarities among different cultures and the speakers of these cultures. All teachers have knowledge about the aspects of the target culture to some extent, but how they deal with the target culture is influenced highly by the curricular considerations and limitations. One suggestion that can be taken from this finding is that teachers should be given more chances to concern with the target culture considerably in their own classes. If they are more flexible in integrating culture, the students may improve more in terms of the exposure to the target culture. It is clear that teacher has an important role to conduct the students learn and understand how people in the target culture act, behave, and communicate. Special attention should be paid to how to teach culture. In this respect, providing various materials related to the target culture would be very helpful for them to become more successful learners who talk with the people from the target culture uninhibitedly.

Different activities and tasks can be designed to identify students to the target culture and existing course books can be enriched with more cultural and cross-cultural themes. What is more, the findings of the study pinpoints that culture should not be treated as a separate entity on its own, but as part of language learning experience. If students do not know and be revealed to the target culture, they may have difficulties in their relations with people from other cultures, and as Esker puts forward they may not develop a critical attitude towards their own and other cultures. [5; 121]

According to Hauser, students' comprehension of other cultures can be expanded as well as their awareness of their own culture by using specific techniques such as ethnographic interviews. Hence, inclusion of different tasks and techniques into the in-class and out of the class lives of the students can be helpful and fruitful to encourage awareness on culture. Therefore, in today's

developing and globalized world, students need to become more competent in building relations with people from other cultures. As Fyrsten berg pinpoints, our goal as teachers is to help building intercultural competence along with the linguistic and communicative competence as well. Hence, the language class can become the cradle of teaching culture and intercultural communicative competence our students need. The teachers in this study are based on the changes and challenges of the contemporary language classrooms and do their best to prepare their students to become globalized citizens. One question that needs to be asked at this point is whether we should insist on teaching standard idealized British/American culture by ignoring. [6; 228]

We cannot ignore change or turn a blind eye. We must get ready to face it in a positive manner. The more cross-culturally competent we become, the more we will understand how our students behave, and the more we will contribute to creating a better learning environment. Interculturalism must serve to enhance different values coexisting together, and, indubitably, storytelling is a key tool in working towards this goal. So, what are you waiting for? It was found that they developed skills to interpret and contextualize cultural practices as well as skills to raise awareness of contextual complexities.

To sum up, pre-service teachers started comparing their home culture with the target culture and such a comparison intended not to be biased or based on stereotypes but rather based on facts that showed how they were able to recognize the virtues and the problems of the other culture and their own. They also noticed the significance of analyzing contextual complexities when teaching a foreign language. In this sense, they developed cultural awareness. In terms of the pedagogical implications, as the participants in this study are foreign languages pre-service teachers and are expected to be future languages teachers, they should. Be aware of the fact that working with intercultural is something they need to be familiar with.

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Rezyume: Maqolada lingvistik va madaniy yondashuvni amalga oshirish asosida talabalarning madaniyatlararo kompetentsiyasini rivojlantirish muammosi ko'rib chiqiladi. Ushbu maqola turli xil ta'lim darajasi, tajribalari, fikrlari va kontekstidagi madaniyatning turli jihatlarini chet tilini o'rganishning bir qismi sifatida berilgan.

Резюме: В статье рассматривается проблема развития межкультурной компетенции студентов в изучении «Иностранный язык» на основе реализации лингвокультурологического подхода. Эта статья может быть основана на том, как учащиеся с разным образованием, опытом, мнениями и контекстом имеют дело с различными аспектами целевой культуры и какие ценности они придают целевой культуре в рамках изучения иностранного языка.

Kalit so'zlar: diagnostika, hayot, shakllantiruvchi, muhim bosqichlar, madaniyat, adabiyot, tarix, arxitektura, madaniyatlararo, Britaniya/Amerika madaniyati, ta'lim, san'at orqali.

Ключевые слова: диагностика, жизнь, формирование, культура, литература, история, архитектура, межкультура, Британско-Американская культура, образование, через искусство.

PEDAGOGICAL ESSENCE OF NATIVE LANGUAGE, SPEECH CULTURE AND RHETORIC IN FORMATION OF COMMUNICATIVE COMPETENCE OF STUDENTS

Pakhratdinov S.

Karakalpak State university named after Berdakh

Summary. *In this article, within the framework of modern pedagogical science, the materials used in the formation of the communicative competence of students, modern rhetorical and creative methods, and the activities of the teacher are analyzed. The place and role of students' communicative competence in quality education has been widely analyzed.*

Key words: *Reform, culture, education, rhetoric, system, competence, development, technology, convention, model, methodology, e-learning, student, subject, humanitarian, communicative.*

Education is gaining importance in the development of the world today. Therefore, the world community is implementing reforms in education. Currently, it is very important to research new and effective educational methods and their practical application in providing quality education. That is why it is necessary to study them scientifically. In his address to the Oliy Majlis on December 20, 2022, the honorable President mentioned the reform of the education system in his statement. "Increasing the quality of education is the only correct way of development of New Uzbekistan" [1] our honorable president said in his speech. In fact, education is the foundation of the state.

The formation of the personality of a university graduate is related to the determination of a set of personal characteristics that a future professional should have. This collection includes qualities that are primarily related to the professional development of a graduate and his economic and political culture, without which it is difficult to live and work in modern conditions. Let's see how communicative competence plays a role in the formation of the professional competence of a future specialist. Communicative competence of a future specialist means the level of knowledge of language and speech that is sufficient for his successful professional activity. The problem of communicative competence is related to the general problems of culture and, in particular, the culture of professional speech. [2]

It is known that culture (Latin culture - cultivation, education, development, respect) is the historically determined level of social development, creative forces and abilities expressed in the types and forms of organization of human life and activity in people's relationships, as well as in the material and spiritual values created by them.

Culture is also a complex interdisciplinary general methodological concept, and its description is very difficult to satisfy specialists of different fields of knowledge. To date, there is no definition of culture that can be considered complete.

According to the general opinion of scientists [2], culture is an invaluable asset of the spiritual world of the people. Culture includes the objective results of people's activities, as well as the level of knowledge, skills, competence, intellectual, moral and aesthetic development, worldview, communication methods and forms implemented in human activities [3]. Material and spiritual culture are in organic unity, historically integrated into a type of changing culture, but at each new stage of development, it is recognized as the most valuable heritage created by the previous culture.

Culture, embodied in the content, tools and products of work aimed at changing the objective world and developing the sphere of human relations, is a way of providing, organizing and improving people's lives on the basis of historical and spiritual values, which is necessarily repeated by the next generations. The core of culture is universal goals and values, as well as

historically formed methods of their perception and implementation. But as a universal phenomenon, culture is individually perceived, assimilated and repeated by each person, which causes him to be formed as a person in interaction with the world of material objects and social relations.

According to L.A. Volovich [4], the development of the socio-cultural paradigm, continuous enrichment, and practical-oriented correction are determined by at least four main directions. Each of these routes is relatively independent, but its existence and development presupposes an integral connection with all others, their integration. Because only their mutual nutrition is the basis for development in autonomous and integrated methods of activity. The first direction is related to preservation, development and enrichment of culture in all its forms, standards, written and oral creativity of our people. This is a whole variety of spiritual, material types, ethno cultural and subcultural formations. The second direction is related to the promotion of cultural intensity and scientific intensity of production. Here there are design versions of promising scientific ideas, developments, use of provocations and technological aesthetic norms, its constant and advanced updating. The third direction is related to the characteristics of the cultural status of young people, their ability to live as consumers and creators of cultural values, which are gaining more and more socio-cultural meaning. The fourth direction is related to the cultural-creative initiative of the continuous education system and the secondary vocational education institution, and as an important component of it, it determines the employability of young people in all directions, in all the mentioned directions.

The transmission of culture from generation to generation includes the development of experience accumulated by mankind, but does not correspond to the utilitarian appropriation of the results of previous activities. The interaction of the individual with the culture can never cover all spheres in complete harmony. Culture will always be the greatest repository of experiences and values to which living generations contribute. Assimilation of culture is understood as a mutually oriented process, for which all the basic laws of communicative activity apply. The success of education at any age is pre-determined by the success of communication between teacher and student. Mastering an object, knowledge, skill requires direct reference to their material form. G. V. Mukhametzyanova emphasizes that the entire history of educational development is a struggle between two main directions: natural and cultural directions. Nature-friendly education is considered as an education that reveals the abilities of a person, which is characteristic of him by nature, is culturally appropriate, and the abilities of a person are formed under the influence of social life.

The culture of the specialist (M.P. Arkhipova, L.A. Volovich, G.I. Ibragimov) can be described as follows:

- development of the whole system of social and professional qualities of a person, which is effectively implemented in individual and collective professional and work activities;
- personal and social maturity manifested in the elimination of certain inconsistencies between knowledge and meaning, internal and external judgment, work and self-esteem, that is, the elimination of contradictions in the specialist's socio-cultural and professional-cultural self-awareness.

We feel a lack of culture in the spiritual sphere, in production, and simply in communication. At the same time, not only the actual state of youth culture, but also the problem of raising the culture of future intellectuals as a factor contributing to the process of transitioning the entire social system to new ways of development is important. Based on the works of L.A. Volovich, A.N. Leontiev, G.V. Mukhametzyanova, N.F. Talizina, V. Shadrikov, the following stages can be distinguished in the professional activity model of a graduate of a higher education institution: analytical-diagnostic, projective-constructive, communication and execution.

By behavioral culture, scientists usually understand the set of formed, socially significant qualities of a person, everyday behavior in society, based on the norms of moral and aesthetic culture. Behavioral culture, on the one hand, represents the acquisition of the moral requirements of society, which are strengthened in norms, principles and ideals, and on the other hand, the rules that guide, regulate and control the behavior of students. Behavioral culture shows the unity of external factors that regulate activity and behavior and the internal - individual capabilities of a person. The rules of the culture of behavior learned by a person become a valuable quality of a person. Since it reflects the rich inner world of a person, respect for manners has been valued in society since ancient times.

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Rezyume: *Ushbu maqolada talabalarining kommunikativ kompetentsiyasini shakllantirishda, ritorik va kreativ zamonaviy uslublarda qullanilgan materiallarning va ta'lim beruvchining faoliyati zamonaviy pedagogik fan doirasidan tahlil qilingan. Sifatli ta'limda talabalarda kommunikativ kompetentsiyasining o'rni va roli to'g'risida keng tahlil etilgan.*

Резюме: *В данной статье в рамках современной педагогической науки анализируются материалы, используемые при формировании коммуникативной компетенции учащихся, современные риторические и творческие методы, деятельность учителя. Широко проанализировано место и роль коммуникативной компетентности студентов в качественном образовании.*

Kalit so'zlar: *Islohot, madaniyat ta'lim, ritorika tizim, kompetentlik, rivojlantirish, texnologiya, konvetsiya, ijodiy, model, metodika, talaba, sub'ekt, gumanitar, kommunikativ.*

Ключевые слова: *Реформа, культура, образование, риторика система, компетенция, развитие, технология, конвенция, модель, методика, студент, предмет, гуманитарный, коммуникативный.*

UDC: 37.012

EFFECTIVE METHODS FOR INSTILLING SPIRITUAL NEEDS IN ELEMENTARY STUDENTS THROUGH THE STUDY OF FOLK ART

Esemuratova T. A.

Nukus state pedagogical institute

Summary: *The scientific justification of the formation of national and universal qualities in students in modern educational conditions, as well as the demonstration and practical justification of the theoretical and methodological ways of its development are the important ways of providing national education through examples of folk oral creativity in primary grades. The article describes that developed methodology for the effective organization of national education based on the study of examples of folk art in primary grades can be used in the effective implementation of education in general secondary schools and non-school institutions.*

Key words: *sense (intellect), manners of behavior, humanistic interrelation, human qualities.*

There is a lot of discussion about spirituality today and one's level of spirituality. These works unquestionably contribute significantly to the spiritual formation of students at the level of their requirements. However, the majority of these works focus on the idea of spirituality, how to convey it to students' minds, and how to shape students' spirituality within the context of one educational subject. Because of this, it is crucial to conduct consistent, methodical research on how students develop their spirituality by determining the crucial aspects of personality formation, such as the need for students to acquire national-spiritual values.

Through the connections between academic subjects, a variety of spirituality-related ideas grow and become more complete. Spiritual needs are based on a person's individuality and the spiritual world. Because of this, the first step is to determine the causes of students' spiritual needs. National, religious, and historical ideas are all connected to the idea of spiritual need. The need to learn about other people's cultures and religions is closely related to the idea of having a spiritual need. A person's spirit is calmed and purified by these religious viewpoints and beliefs. A person's psyche and inner world can be profoundly affected by Islam in a variety of ways. The concepts of the human body and spirit, of good and evil, of sin and merit, and of spiritual growth are contrasted in religious perspectives.

Students are motivated to fully realize their inherent abilities because they are required to acquire national-spiritual values. The student comes to the realization that his body, mind, soul, and spirituality are all one and the same thing, because a person's body, soul, and spirit are three distinct parts, because pedagogical influence on the student's psyche shapes his need to learn national-spiritual values.

In the Uzbek national encyclopedia, the term "spirit" is defined as follows: **Soul** (mind) is an element of profoundly coordinated matter (cerebrum) that comprises in reflecting reality in an extraordinary structure. It is essentially reflected in intuition, imagination, thinking, volitional behavior, and various subjective images.

Since the idea of spirit is a part of what it means to be human, it makes sense to look at it from the body and soul of a person as they form a particular need. In Zoroastrianism and Islamic teachings, for instance, each of the concepts of the body, soul, and spirit is elaborately discussed.

God created the human body, which is made of tiny sand grains. As a result, man is a part of the earth. Man's body is the same as that of other animals. Like other animals, man tries to meet his body's needs. The human body has many different needs, which can be met in two ways: the need

to maintain one's existence and self-preservation. The human body has five sensory organs that allow it to communicate with the outside world: organs for sight, hearing, smell, taste, and basic movement

The soul is the second well-known idea. God also gives humans the heart. The heart controls the body and gives it life. It is a person's life force. It links a person's mind, body, and spirit together. A person's feelings, thoughts, desires, and needs are moved by the entire heart movement. The mind, feelings, and desires are all met by the heart. A desire of the human heart is also the need to acquire knowledge and national and spiritual values.

The psyche is another important part of who we are. There are three types of human psyche: worship of God, conscience, and fear of God. A condition that is connected to unwavering, unwavering faith is the feeling of fear of God. A person truly believes in God and believes in his existence. When he commits sins, he is afraid of him. Conscience is the second crucial component of the human psyche. A person's conscience teaches them what is right and wrong. It emphasizes the necessary and undesirable actions. He is the person's internal critic. In the third appearance, God is worshiped. The human spirit looks to God and nature for its identity. He seeks God and worships him. Through worship, he meets the soul's need.

The fact that today's human spirit requires self-awareness, conscience, freedom, and intuition is fully supported by advanced scientific perspectives. The human spirit, on the other hand, longs for and requires intelligence, comprehension, and observation. because acquiring intelligence tends to help the human mind satisfy its needs and make important decisions.

Experts have demonstrated that he always requires love, joy, peace, patience, kindness, goodness, mercy, trust, and endurance, stressing that spirituality has a practical place in human life. First and foremost, this need will be met by acquiring the Uzbek people's national and spiritual values, which have been defended for many centuries and produced significant practical results.

As can be seen from the foregoing, one of the most pressing socio-pedagogical issues awaiting resolution is the development of a pedagogical system with the goal of motivating students to perform good deeds in order to achieve moral and spiritual perfection. During the educational process, it is desirable to establish favorable pedagogical conditions for the development of the student's physical, mental, and emotional needs. The young body only begins to perform good deeds when it feels the need to strive for physical, mental, and emotional purity.

A person's goals and dreams are linked to their purity and heart's desire. It is motivated by feelings. Because he needs to improve his body and soul, man always strives for improvement. He chooses his "I" and personal life. A person's level of consciousness determines his or her personal life. His "I" also reflects this. His personal nature, talent, maturity, accomplishments, happiness, and perfection all reflect his "I." The most important factor in a person's life is his psyche. Students can consistently acquire moral values because of the same need.

During the period of independence, the concept of spirituality and the formation of students' spirituality received special consideration. Many studies on the philosophical, social, pedagogical, and political aspects of spirituality, spiritual education, and spiritual upbringing were carried out during this time period. Pedagogues O. Musurmonova "Formation of the spiritual culture of students," "Spiritual values and education of youth," "Family spirituality is national pride," M. Kuronov "Scientific-pedagogical foundations of national education in general secondary schools of Uzbekistan," Safo Ochil "The spirituality of independence and foundations of education," U. Makhkamov "Ethics-etiquette lessonsAleuov, " Pedagogical thought formation and development in Karakalpakstan," H. Boboev, "Ideology and development of national independence," A. Zunnunov, "Pedagogical theory," B. Kadirov, "Pedagogical foundations of perfect Christian education," S. Nishonova, "Spiritual lessons," X Tilashev, "General anthology of Uzbek pedagogy," "History of Pedagogy," "Basics of Spiritual and Moral Education," and "Pedagogical Ideas of Abu Rayhan Beruniy" by Z. Nuritdinova and E. Torakulov, respectively. Concerning education and spirituality,

S. Rakhimov's "Psychological views of Abu Ali ibn Siny," K. Nosirov's "Central Asian philosophers' thoughts of IX-X centuries about moral education," F. Babashev's "The scholars of Khorazm Ma'mun Academy spiritual and moral views,"

When we consider the process by which students acquire national and spiritual values, the mentality of the Uzbek people come to mind first. **Mentality** (Latin mentalis-mental) is a person or social group's level of mental ability and spiritual potential. It includes the mentality of a society, nation, or individual, as well as their distinctive religious beliefs, historical traditions, and customs. Every nation's mentality is connected to its history, living conditions, social life, and a number of other things. Because conducting an analysis of this concept is crucial to the development of a system for instilling in students the need to acquire national and spiritual values. The Islamic faith forms the foundation of the Uzbek nation's mentality. Our ancestors lived in this vast region for centuries on the basis of the exact harmony and values, or history and life, that nature has given us, the Central Asian people, invites one to live in such a spirit of cooperation and friendship.

To put it succinctly, for us, this perspective on historical reality and the experience of living together have evolved into a life philosophy, or more precisely, a life rule. If we use modern language, this is such a characteristic that sets us apart from other nations and serves as the foundation for our national mentality that it is impossible not to notice, comprehend, and observe it.

Both educational reforms and fundamental shifts in society necessitate comprehensive thinking. For many years, it is common knowledge that the Uzbek people have deviated gradually from their original spiritual culture. The decline of national social consciousness was caused by our nation's departure from its traditions and roots. Because of creating some distance from the otherworldly roots, the social climate and social relations in the existence of the general public are obliterated. There will be a moral crisis, as well as an increase in selfishness, criminality, and identity alienation. Foreign cultures begin to fill in for the gap that was previously there, and young people, in particular, begin to participate more actively during this process. Young people are more likely to be influenced by this.

Because of this, society today feels the need to instill in students a desire to acquire national and socio-spiritual culture. In order to accomplish this, it is necessary to set up an educational system that instructs young people and forces them to acquire national spiritual values. Students can organize and build their personal lives through this method. Their spirituality develops, they begin to make responsible choices for both themselves and society, and they are given the opportunity to choose their life paths in a thoughtful and accurate manner. All of this is carried out with the intention of encouraging students to acquire national moral values through the educational process. A crucial requirement of today is to place the student's personality at the center of the humanitarian education process, because the educational process is unique to each student. Students and teachers alike should exhibit moral and emotional integrity in the classroom.

The individual requirements of each student were not taken into consideration during the educational process at school for many years. The following is a definition of the word "need" found in the Uzbek language's explanation dictionary:

Demand for something; need desire, necessity, need. First and foremost, it is necessary to ascertain whether or not students are required to acquire knowledge of national moral principles. In their activities, they ought to feel the necessity of national spiritual values. From a pedagogical perspective, issues like self-education and national spiritual improvement among elementary school students did not gain special significance due to this necessity. The use of examples from fiction, history, and national art and culture was given no weight. However, at this age, students recognize and comprehend themselves. Their spiritual world within opens. Students acquire national morality skills during this time of high responsibility. It is determined how one views oneself, the people around them, and members of society. This is the predominant era-wide trend. Strong aspirations for self-awareness, self-expression, self-assertion, and self-assertion are examples of these.

The analysis of the current situation in the school reveals that primary school students have a stronger desire for material wealth than they do for spiritual values. That is, there are various and sometimes opposing viewpoints regarding the relationship between a person's material and spiritual foundations in their day-to-day activities and lives, as well as which one has priority, and as a result, it is evident that these disagreements are still ongoing⁶."

The aspirations of students are unstable, and their outlook is incorrect. It is impossible to contemplate instilling moral values in them in such a circumstance. Students' impulsive decisions and actions are prompted by unstable confidence. The main reason for this is that you don't just do what's expected of you. Parents and teachers frequently compel students to adhere to these standards. These students lack sufficient comprehension and definition of their life goals. They lack sufficient skills and knowledge regarding society's moral standards and behavior guidelines.

This situation necessitates instilling in primary school students the need to acquire spiritual and national values. The need for elementary school students to acquire national-spiritual values is important to the development and dynamic strengthening of this need, and examples of fiction, historical reality, the activities of national heroes, religious values, folk traditions, scientific heritage, and the idea of national independence are important have. As a result of their extensive collection of national and universal spirituality.

Yu is currently responsible for the issue of students developing spiritual needs V. Sharov, N.e. Shchurkova, T.N. Kaptan and T.I. Vlasova, and L. N. Razuvaeva investigated the issue of spiritual needs formation among university students to some extent. The place of spiritual needs in students' moral development is discussed by N.e. Shchurkova. In addition, one of the unexplored issues in the science of pedagogy appears to be the student's spiritual development. Because of this, the state's policy places a high priority on addressing this issue.

There is a lot of discussion about spirituality today and one's level of spirituality. In this area, a lot of scientific research has been done. These works unquestionably contribute significantly to the spiritual formation of students at the level of their requirements.

On the basis of the aforementioned points, it should be noted that it is appropriate to establish a pedagogical system aimed at forming the need for acquisition in order to eliminate the contradiction between the need that has emerged in general secondary schools today and the process of forming the need to acquire national values. The national values of primary classes, which are focused on a single goal, should be appropriate. In addition, determining the means, methods, and methods of implementing the strategies of formation of the spiritual need to acquire national values in primary school students is an important task.

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Rezyume: *Maqolada zamonaviy ta'lim sharoitida o'quvchilarda milliy va umuminsoniy fazilatlarini shakllantirishning ilmiy asoslanishi hamda uni rivojlantirishning nazariy-metodik yo'llarini ko'rsatish va amaliy jihatdan asoslash xalq ta'lim-tarbiyasini xalq og'zaki ijodi namunalari orqali ta'minlashning muhim yo'llari ekanligi haqida so'z boradi. Maqolada boshlang'ich sinflarda xalq og'zaki ijodi namunalari o'rganish asosida milliy ta'lim-tarbiyani samarali tashkil etish bo'yicha ishlab chiqilgan metodikadan umumiy o'rta ta'lim maktablari va maktabdan tashqari ta'lim muassasalarida ta'lim-tarbiyani samarali amalga oshirishda foydalanish mumkinligi bayon etilgan.*

Резюме: В статье речь идет о научном обосновании формирования национальных и общечеловеческих качеств у учащихся в современных условиях обучения, а также демонстрации и практическом обосновании теоретико-методических путей его развития как важных способов обеспечения национального воспитания на примерах народного творчества. устное творчество в начальных классах. В статье показано, что разработанная методика эффективной организации народного образования на основе изучения образцов народного творчества в начальных классах может быть использована при эффективной реализации образования в общеобразовательных школах и внешкольных учреждениях.

Kalit so'zlar: sezgi (intellect), xulq-atvor, o'zaro insonparvarlik, insoniy fazilatlar.

Ключевые слова: смысл (разум), манеры поведения, гуманистические взаимоотношения, человеческие качества.

UDC: 37.012

THE DEVELOPMENT OF STUDENTS' CAPACITIES FOR SELF-EVALUATION AS A PEDAGOGICAL ISSUE

Matmuratova G. K.¹, Qarlibaev P.T.²

¹*Nukus state pedagogical institute,* ²*Technical school of law of the Republic of Karakalpakstan*

Summary: *The article deals with a step in the assessment that is to determine the learning objective. The article describes entire educational process which is connected to general and perspective-oriented objectives. Also, the primary objective embodies the objective of mastering a particular educational subject have been described.*

Key words: *assessment abilities, manners, conduct, interpersonal relationships, universal qualities, and value.*

The creation of a theoretical foundation for developing students' abilities to evaluate their own activities as early as elementary school age is currently one of the most pressing challenges facing the science of pedagogy. There is insufficient scientific information in this area. In the theory of pedagogy, it's important to make the theoretical foundation for learning how to evaluate and diagnose student activities on their own.

In addition, we attempt to justify the requirement that a person undergoing continuous education acquire the skills necessary to evaluate and diagnose his activity, knowledge, skills, qualifications, and level of adaptation to society. Additionally, experts in a variety of educational technologies, such as V.N. Zaitsev, L.V. Zankov, D.B. Elkonin, M. Ochilov, N. Sayidahmedov, and O.Tolipov is of the opinion that students possess these abilities.

However, the literature on students' own activity assessment shows that assessment skills are two interconnected steps in a single process that are emphasized in numerous sources. As a didactic process, the diagnostic process is examined separately from the evaluation process in some studies. The problem's analysis reveals that no scientific study has examined the formation of assessment and diagnosis skills as a whole as a didactic phenomenon.

Our investigation revealed that modern general secondary schools do not offer any courses that teach students how to evaluate and diagnose problems. We observed that this circumstance was ignored when we looked at the teachers' actual activities. Additionally, the analysis demonstrated that the student's abilities in diagnosis and assessment are appropriate for general secondary education. Because of this, it must be shaped in a complex way.

In the primary grades, it is appropriate to initiate pedagogical measures aimed at developing assessment skills, because the primary education system provides convenient pedagogical opportunities for social life preparation.

The works of R. Safarova, B. Adizov, O. Rozikov, R. Ibragimov, H. Nazarova, V. V. Davydov, L. V. Zankov, N. F. Talyzina, and D. B. Elkonin contain fundamental research that aims to teach elementary school students. Students' abilities in assessment and diagnosis are shown to play a significant role in shaping educational skills and qualifications, improving educational process organization, and altering educational content.

The analysis demonstrates that the following cases are not balanced:

- 1.the lack of theoretical foundation for the diagnostic skill as an educational skill;
- 2.Assessment and diagnosis are not sufficiently grounded as a single educational skill in the current didactics, and their connections are not investigated.
- 3.Lack of technology development for the development of assessment and diagnosis skills and their necessity.

The aforementioned demonstrates that this issue has not been adequately addressed, necessitating the development of diagnostic and assessment skills to ensure the student's consistent personality development.

Consideration of this didactic phenomenon as an important educational direction is necessary for the theoretical justification of the process of developing students' abilities to evaluate their own activities. Assessment and diagnosis abilities ought to be highlighted as an essential component of learning skills, as demonstrated by the findings of student formation of learning skills and comparison of pedagogical skills with learning skills. We attempt to identify the particular characteristics and components of assessment and diagnosis skills for this purpose. As a result, we examine the specific aspects of assessment and diagnosis skills in educational activities and examine them as an essential component of the knowledge process.

Assessment is one of pedagogy's traditional and enduring instruments.

According to the Uzbek National Encyclopedia, evaluation is an attitude toward social relations, human activity, and behavior that shows their importance, complies with certain moral norms and principles, approves or condemns, agrees, and emphasizes that it consists of being or criticizing. The philosophical aspects of evaluation are revealed. It is also influenced by a person's mental and moral maturity, worldview, cultural level, and social status. However, in order to accurately evaluate a person, it is necessary to take into account the reasons, means, and objectives of the action, the circumstances in which it was carried out, and its place in their personality².

Psychological assessment is recognized as the product of a specific study in the psychological literature. Its purpose is to reveal a person's psychological and individual traits.

From a modern pedagogical perspective, assessment, in our opinion, is the teacher's attitude toward the student's level of knowledge, skills, and abilities, as well as their personal qualities.

In pedagogy and school practice, the idea of assessment has not been thoroughly explained. This idea can be approached in a number of different ways. The assessment was examined by a number of authors as an evaluation of the activity process. The importance of ensuring that the outcomes of the education match those of the prior tasks is emphasized. Students' knowledge requirements ought to be comparable to those of society. These stages of the educational process are a way to show students' knowledge, skills, and qualifications as well as their level of culture. The grade indicates the level and quality of the students' knowledge, skills, and qualifications, as stated in the normative documents. We are able to comprehend the degree to which the achieved result conforms to the objectives and responsibilities of education through the concept of evaluation. The issue of demonstrating the value and significance of it in the educational process has been addressed by a number of scientists. Musaev, U., Musaev, P., and Sh.O. S. Bogdanova, L. I. Bojovich, and L. Yu. A. Amonashvili A. I. Lipkina, T. L. Museridze, N. A. Menchinskaya, B. I. Khachapuridze, D. B. Elkonin, V. S. Yurkevich, and others The authors say that assessment also represents the kinds of independent and active activities. The evaluation's primary goal is to steer the student's educational pursuits in a positive direction.

Experts say that there are two sides to evaluation: sides with reflection on the outside and inside.

The student's activities with the teacher and classmates result in external assessment.

The student provides the internal or reflective assessment. The student evaluates both the educational activity itself and its outcomes. Assessment always directs both the student and the teacher to improve the process's outcomes and correct any errors made. It is an essential component of the educational activity. At every stage of completing educational tasks, assessment is required. Errors and shortcomings can be eliminated by evaluating the educational process's and the student's activities' outcomes. The tasks to be solved are planned based on the evaluation of the educational process's outcomes. We believe that assessment plays a crucial role in holistic monitoring and analysis of the educational process.

The issue of checking and evaluating the student's activity during the educational process is the subject of several works. These are meant to solve issues like what knowledge, skills, and qualifications are required, how to track students' knowledge, skills, and qualifications, and what kinds of knowledge accounting are [Zaretskiy II. Kulibaba IYa. Lerner e. VA. Perovskiy. Runevskiy M. N Skatkin. P. Strezikozin] studies of various levels have examined the issues of checking and evaluating the activities of teachers and students. Individual, mass, thematic, and final survey control methods have been defined for the purpose of developing the methods for controlling the students' oral, written, drawing, and computer-aided work.

The quality interpretation and evaluation of each student's individual work, oral and written speech, creative activity, and oral and written speech are all critically important to the teacher. The assessment not only has educational value but also performs significant psychological tasks. The development of the ability to evaluate and diagnose the student's own activity is also important, in addition to issues like the educational significance of the assessment, the conditions for the teacher to have a psychological effect on the student, and the ability of the teacher to manage the educational process. is significant.

Some scientists say that the teacher helps the student with the evaluation. This is a bad idea based on the modern approach to education. By doing so, the student is subordinated during assessment. The student ought to be able to comprehend why he or she received this grade and the objectivity of the grade he or she has achieved in any circumstance. If the student is able to accurately assess his own personal capabilities and knowledge, this assessment will have a positive impact on his mental state. Pedagogical assessment also does a lot of important things. From these,

pointing the student in the direction of positive or educational endeavors;
- urging the student to correct, enhance, and boost his performance;
- making plans for future educational events;
- developing a plan of personal action;
- for instance, becoming accustomed to improving the action plan by monitoring its execution.

In contrast to diagnosis, pedagogical assessment is more general and has a particular effect. The following categories of grades are given to the student:

- partial, or the initial appearance of the evaluation;
the recorder;
- evaluation that is consistent

The first type of grade is a partial grade, which indicates the student's level of knowledge, skills, and abilities in a particular area. The student's partial assessment is not always complete or accurate. These evaluations frequently take a straightforward form.

Numbers or points are used to represent the significant values. Teachers and experts use recording points for this reason.

The student's personality and behavior are represented by the adapted grade. When evaluating their activities, students primarily use oral and integral forms of assessment. For instance, I am great, good, and excellent, and my friend is strong or weak, well- or poorly-informed.

The evaluation is expressed in the following manner in relation to the possibility of formation:

- explicitly;
in indirect way.

Person-centered assessment is direct assessment. Take, for instance, the teacher's assessment of the student's work.

A third party conducts indirect assessment. It is graded by other students or a particular student.

Motivational assessment is another type of evaluation that:

- an inaccurate evaluation; This kind of evaluation, which suggests that the student does not have sufficient experience, is frequently given by the student to himself.

- an uncertain evaluation; Students who are unable to accurately diagnose their own activities and who have not fully developed the skills of self-evaluation are given such an assessment.

- a direct, positive evaluation; This kind of assessment is first given to the students by the teacher, and then it is given to them and their classmates by the students themselves, who are skilled at making precise diagnoses and evaluating situations.

- a direct negative evaluation; This kind of test is mostly given by teachers to students who have trouble grasping the material and to their emotional classmates and friends.

V.A. Yakunin asserts that students who are slow learners have significantly lower abilities ratings than students who learn well. They are more proud of their work than the teacher is. The overall positive grade of the class is the grade earned by students with high mastery, and as a result, the class's average grade has a high index. The students in the class develop a negative attitude toward excellent students as a result of inappropriate and non-objective evaluations. Assessment objectivity issues and children's perspectives on them G.A. Sobleva e.e. A. Serebryakova The scientific works of A.A. Rybak cover A. Lipkina. The role that assessments play in the educational process is evolving today. The shift in the general tendency to study explains this.

The essence of assessment as the primary trend of educational activity was studied by L.I. Bojovich, N.T. Morozova, L.S. Slavina, A.K. Markova, T.A. Matis, A.B. Orlov, and L.M. Friedman. By adhering to didactic principles, effective assessment can be achieved.

Humanity, objectivity, foresight, and cooperation are the guiding principles of the evaluation process in modern educational systems. This method typically achieves the desired outcome. Humanitarian evaluations aid in the development of mutual respect, trust, and an objectively positive attitude between the educator and the student as well as the group of students. The student's independence and ability to manage themselves grow when these kinds of relationships between them and their teacher are resolved. The student gains confidence in his or her own abilities as a subject of the educational process when there is mutual cooperation and uniformity in the field of assessment.

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Rezyume: Maqolada o'quv maqsadini aniqlash bo'lgan baholash bosqichi haqida so'z boradi. Maqolada umumiy va istiqbolga yo'naltirilgan maqsadlar bilan bog'liq bo'lgan butun ta'lim jarayoni tasvirlangan. Shuningdek, asosiy maqsad ma'lum bir o'quv predmetini o'zlashtirish maqsadini o'zida mujassam etganligi tasvirlangan.

Резюме: В статье рассматривается этап оценивания, который заключается в определении цели обучения. В статье описывается весь образовательный процесс, связанный с общими и перспективными целями. Также, первичная задача воплощает в себе задачу овладения тем или иным учебным предметом.

Kalit so'zlar: baholash ko'nikmasi, odob, xulq-otvor, insonparvarlik munosabatlar, umuminsoniy fazilatlar, baho.

Ключевые слова: оценка способностей, манер, поведения, межличностных отношений, универсальных качеств и ценности.

UDC: 37.012: 372

**IMPORTANCE OF PEDAGOGICAL COOPERATION OF SCHOOL AND FAMILY IN
PHYSICAL EDUCATION OF SCHOOL-AGED CHILDREN**

Nurishov D.Y.

Nukus Branch of the Uzbekistan State University of Physical Education and Sports

Summary: *The article deals with the importance of pedagogical cooperation of school and family in physical education of school-aged children. The paper describes the researchers note that "it is during the pedagogical sessions that it is possible to familiarize parents with the content and methods of physical education in family and school conditions. Also, in the article, effective forms of activating pedagogical cooperation of school and family in physical education have been described.*

Key words: *ecological culture, pedagogues, physical education, physical development, pedagogical cooperation, school, parents.*

In our research, we devoted a special place to innovative forms of organizing parental education: sociological surveys, interviews, questionnaires and tests with pedagogues, students and parents, in connection with this, social and psychological studies were regularly conducted to study the level of sports achievements of students. This allows for the correction of general educational work (training programs on physical education, courses of psychological-pedagogical enlightenment of parents). In the active innovative forms of methodical and psychological education of parents, we include master classes and dissemination organized by parents themselves, that is, generalization and distribution of positive and effective experience of family physical education.

The experimental work was carried out in the base of schools #11 #17 of Muynak district of the municipal budget educational institution of the Republic of Karakalpakstan. A total of 126 students and 110 parents participated in the study (53 people - NG and 57 people - EG). The study was conducted in stages from 2019 to 2021. Psychological-pedagogical methods (questionnaire "Professional position of pedagogues (parents)" [1, 3] were selected for the organization of research, development of ecological culture in physical education classes of high school students, and participation in various sections of physical development and health training the level of pedagogical competence of the children was studied on various issues that parents are most interested in. At the beginning of such work, we held a seminar for pedagogues and parents, in which the current issues of cooperation with parents were considered: the formation of ecological culture in the physical education classes of parents and pedagogical activation and enrichment of parenting skills and communication with the child at home in a meaningful and emotionally enriched way; in them, the personal experience of physical upbringing of children in the family, a conscious attitude to one's parental duty and the formation of an active position and creative activity: the program during the implementation of the first diagnostic-confirmatory stage (2019-2021) - the following works were carried out:

- characteristics and problems of family physical education were studied in difficult conditions;
- a diagnostic instrument was chosen to determine the actual problems of physical education in the families of regions;
- diagnosis of problems of pedagogical cooperation of school and family in physical education of children was carried out;

- regulatory documents and work experience in other educational institutions and families were studied with parents;
- physical development and physical abilities of the experimental and control groups were tested;
- The pedagogical support program for physical education in (QQRXTVQ) "№11 and #17" was developed and a working group was formed for its implementation;
- psychological-pedagogical training of parents on physical education of children and formation of health skills in them was improved.

The second stage - the stage of implementation of the program "Pedagogical cooperation of school and family in physical education of children" (2019/20 and 2020/21 academic years) determines:

- problematic analysis of the situation of pedagogical support of physical education in rural families;
 - introduction of the part program "Pedagogical support of physical education in the family".
- During the implementation of the part program with the active participation of parents, the pedagogical and psychological features of choosing new forms and methods of physical education of children were studied, public physical culture-health activities aimed at maintaining and strengthening the health of students in upper grades were conducted;
- improvement of the system of pedagogical support in physical education of children in families;
 - implementation of the partial program "Formation of health value and healthy lifestyle in parents and children".

In the implementation of this program, school pedagogues strive to involve parents in the issues of health skills and the formation of an ecological culture of a healthy and safe lifestyle. During this, educational work was carried out in the form of lectures by specialists (psychologist, doctor, trainer); parent meetings were held for parents on physical education issues.

Stage 3 - the stage of full implementation of the program "Pedagogical cooperation of school and family in physical education of children" (2020/21 academic year). The following studies were conducted at this stage:

- pedagogical support of physical education in the family and in "Schools No. 11 and No. 17" (QQRXTVQ) were developed and improved;
- summarizing the results of program implementation. 9-10-11 grade students and their parents were recruited into the experimental group by the physical education program. Pupils of the experimental class - according to the program "Pedagogical cooperation of school and family in physical education of children". At the beginning of the 2018-2019 academic year, the children of the control and test groups were examined. Their physical development and physical abilities were evaluated. The psychological and pedagogical characteristics of children, the level of development of parent-child relations, and the potential of family education were determined. We used the innovative technology of activation of pedagogical cooperation between school and family, and it was determined to organize pedagogical education of parents based on integrative and systematic approaches. It was conducted in the following directions:
 - continuous psychological-pedagogical support of the family upbringing process at various stages of the family's own development and physical upbringing of the child;
 - involve all family members as much as possible in physical education classes, using interactive methods in solving the tasks of physical education of children and forming healthy lifestyle values;
 - involvement of parents in active activities within the framework of school self-management, organization of joint free time of children and parents, contests and competitions in physical culture and sports events;

- activation of active participation of children and their parents in internal school, district and city sports and leisure activities.

The program developed by us is a program for the activation of pedagogical cooperation between school and family in the physical education of children of small school age, various traditional and innovative forms of parent education training: lectures, seminars, video conferences, conducting circles, "brainstorming", work and role-playing games, trips, educational experience dissemination application. Practice shows that much more time is spent preparing for a parent meeting or extracurricular activities than preparing for a classroom lesson. Parents come to our events with great interest, try not to miss parent education sessions and pedagogues meet regularly in an informal setting. The function of pedagogues in providing knowledge to parents and integrating the potential of family and school education in the context of the research problem is:

- consists in physical education of children, organization of their free time and skillful determination of school and family problems;

- in assessing the condition of the child, his psycho-pedagogical physical processes and social relations;

- in determining the level of readiness and activity of parents in physical education and planning children's free time, we are preparing for classes. (to the decree of the President of the Republic of Uzbekistan No. PF-5924 of January 24, 2020) We used the materials of the state program on measures to further improve and popularize physical education and sports in the Republic of Uzbekistan, "which creates conditions for physical education and health, as well as healthy among workers We used the national project "Health Care" to encourage employers who promote a lifestyle, where the main requirements of physical education are: to improve the quality of the organization of physical culture-health work in various types of educational institutions, to maintain and strengthen the health of people and parents and children actualization of a healthy lifestyle as an important ability [5, 6], family physical education magazines on the organization of family physical education "Physical culture theory and practice", "Physical culture in school", "Physical culture: upbringing, education, training" "Family and school b", "Student Education", "Sports Science Correspondent", "Public Education" scientific articles and methodical materials on pedagogy and psychology, film, video and audio materials on organizing various forms of physical education and strengthening children's health in family conditions. The materials of these journals made it possible to reveal the problems of scientific, methodical and organizational work on physical culture and sports, and the articles of scientists, pedagogues and trainers about new systems and methods, the results of research and experiments conducted in schools of Muynak district were discussed with parents. Work on parental education in the district school was carried out by organizing exhibitions of children's creative works, research works, exhibitions of children's psychological and pedagogical literature, children's magazines and newspapers. School events for parents, tourist sleds with the participation of parents, sports holidays, competitions and others are held. We made a separate schedule for training with parents, which was approved by the school director, in which the days and times of the week for each selected form of parent education were determined. In addition, educators from us; personal interviews and consultations were held with physical culture teachers and specialists of various services of the school. Parents are notified in advance or in person of all changes to the lesson schedule and counseling. Parent training was conducted at their convenience without additional burdens. In the process of research, more active and effective traditional and innovative forms of effective implementation of the program with the involvement of parents were:

- organization of traditional "Health Days" (parents helped organize trips, various competitions and took an active part in them);

- organization of annual sports competitions "Volunteer Starts" (in addition to children's teams, teams of parents and teachers participated) and an exhibition on the topic of health and healthy lifestyle (children's work was presented as well as parents' work);
- organization of competitions "Father, mother and I - sports family" (competition of family teams);
- participation in the work of sports sections;
- organization of physical culture lessons taking into account the personal characteristics of students.

Thus, one of the effective forms of activating pedagogical cooperation of school and family in physical education of children are as follows:

- organization of various individual and group consultations, oral journals and discussions with the participation of psychologists, doctors, physical education and education specialists. Parents were introduced to family upbringing experiences. Practice shows that the most effective form of communication between the pedagogue and parents is parent meetings.

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Rezyume: Maqolada maktab yoshidagi bolalarning jismoniy tarbiyasida maktab va oilaning pedagogik hamkorligining ahamiyati ko'rib chiqiladi. Maqolada tadqiqotchilarning ta'kidlashicha, "pedagogik mashg'ulotlar davomida ota-onalarni oila va maktab sharoitida jismoniy tarbiya mazmuni va usullari bilan tanishtirish mumkin. Shuningdek, maqolada maktab va maktabning pedagogik hamkorligini faollashtirishning samarali shakllari ko'rsatilgan. Jismoniy tarbiyadagi oila tasvirlangan.

Резюме: В статье рассматривается значение педагогического сотрудничества школы и семьи в физическом воспитании детей школьного возраста. В статье описаны исследователи отмечают, что «именно в ходе педагогических занятий возможно ознакомление родителей с содержанием и методами физического воспитания в семейно-школьных условиях. Также в статье рассмотрены эффективные формы активизации педагогического сотрудничества школы и описаны семьи в физическом воспитании.

Kalit so'zlar: ekologik madaniyat, pedagoglar, jismoniy tarbiya, jismoniy rivojlanish, pedagogik hamkorlik, maktab, ota-onalar.

Ключевые слова: экологическая культура, педагоги, физическое воспитание, физическое развитие, педагогическое сотрудничество, школа, родители.

APPROACHES TO THE STUDY OF THE CONCEPT IN LINGUOCULTUROLOGY

Djumamuratova G. J.

Nukus state pedagogical institute named after Ajiniyaz

Summary: *In the given article deals with the approaches to the study of the concept in Linguoculturology. In linguistics, the study of the concept is carried out within the framework of two main areas: cognitive and linguoculturological. We consider the concept from the point of view of linguoculturology. Also, there are given opinions and definitions about studying the concept in linguoculturology by some linguists.*

Key words: *linguoculturology, concept, approaches, notion, national-cultural specificity.*

In modern linguistics, the study of the concept is carried out within two areas: cognitive and linguoculturological. According to representatives of the cognitive direction, such as Yu.D. Apresyan, A.P. Babushkin, N.N. Boldyrev, N.A. Kobrina, E.S. Kubryakova and others, the cognitive approach is the modeling of the speech-thinking activity of the individual and the selection of the concept as an element of such activity or the analysis of the reflection of the results of speech-thinking activity in the language. With the linguoculturological approach to the study of the concept, attention is paid to the culturological aspect. Scientists such as S.G. Vorkachev, V.I. Karasik, V.N. Teliya, Yu.S. Stepanov and others are working in this direction.

In this article, we consider the concept from the linguocultural point of view.

Linguoculturology as an independent discipline of linguistics, which arose at the end of the twentieth century, studies the language at the intersection of linguistics and cultural studies. According to the definition of V.N. Teliya, linguoculturology is aimed at the study of language and culture in their synchronous interaction [1: 217-222].

According to V.A. Maslova, the object of this area of linguistics is “the study of the interaction of language, which is a translator of cultural information, culture and its settings and preferences, and a person who creates this culture using language” [2: 35-36].

According to the definition of V.V. Vorobyov, linguoculturology is “a complex scientific discipline of a synthesizing type that studies the relationship and interactions of culture and language in its functioning and reflects this process as an integral structure of units in the unity of their linguistic and extralinguistic (cultural) content using system methods and with a focus on modern priorities and cultural institutions (systems of norms and social values)” [3: 25-126].

So linguoculturology as a science, its subject, object, tasks are generally defined as follows: linguoculturology is a science that arose at the intersection of linguistics and cultural studies and explores the manifestations of the culture of the people, which are reflected and fixed in the language [2:28].

The main goal of linguoculturology, according to E.O. Oparina, is “the description of the picture of the world in the form in which it is presented in the speech of native speakers, in various discourses and different (verbal and non-verbal) texts of culture” [4: 7].

Thus, from the standpoint of linguoculturology, language is studied as a human factor and as a carrier of a certain national mentality and collective cultural experience, encoded in the meanings of linguistic units.

The subject of the study of linguoculturology, according to V.A. Maslova, are: 1) non-equivalent vocabulary and lacunae; 2) linguistic units in mythology: archetypes and mythologemes, rituals and beliefs, rituals and customs enshrined in the language; 3) the paremiological fund of the language; 4) phraseological fund of the language; 5) standards, stereotypes, symbols; 6) metaphors and images of language; 7) stylistic structure of languages; 8) speech behavior; 9) area of speech etiquette [2:36-37].

Linguoculturology creates its own conceptual and terminological apparatus, combining its linguistic and cultural foundations. Its basis is the recently actively used concept in linguistic literature. The concept of “concept” can be considered from a linguistic and philosophical point of view.

Following V.I. Karasik, we believe that “a concept as a mental formation in the mind of an individual is an exit to the concept sphere of society, i.e. ultimately, on culture, and the concept as a unit of culture is the fixation of collective experience, which becomes the property of the individual” [5:135].

V.A. Maslova correlates cultural concepts with the names of abstract concepts in which cultural information is attached to the conceptual core [2:20].

It is also necessary to distinguish between the terms “concept” and “notion”. After analyzing a number of studies on this issue (Yu.S. Stepanov, V.A. Maslova, N.N. Boldyrev, A.P. Babushkin), we believe that despite the single order and blurring of boundaries, the concept and concept are not different terms.

On this issue, we are in solidarity with V.A. Maslova that if “a concept is a set of known essential features of an object, then a concept is a mental national-specific formation, the content plan of which is the whole set of knowledge about a given object, in the expression plan, a set of linguistic means (lexical, phraseological, paremiological etc.)” [2:35-40].

From the point of view of linguoculture, the concept is defined as “an ideal formation reflecting nationally conditioned ideas and ideas of a person about the real, “real” world” [6:85] and is rightfully considered a basic element of culture.

In all concepts, ideas are formed that arose at different times and in different eras. As a result, concepts form “a kind of cultural layer mediating between man and the world” [7:3].

In our opinion, the definition proposed by Yu.S. Stepanov most clearly reflects the term “concept” in the context of culture. So, according to the researcher, the concept is defined as a “clot of culture”, in the form of which it enters the mental world of a person [8:43].

This is a unit of individual and collective consciousness, which has a fixed linguistic representation, allowing to recreate the worldview of each nation in the conceptual picture of the world.

According to V.G. Zusman “the concept is always a part of the whole, bearing the imprint of the system as a whole. The concept is a micro model of culture, and culture is a macro model of the concept. The concept generates culture and is generated by it” [9:41].

As S.G. Vorkachev rightly adds, the concept is “first of all, a verbalized cultural meaning. It is “by default” a linguocultural concept” [10:78-82].

It should be emphasized that the most important difference between the linguocultural concept and other mental units lies in its axiological aspect, i.e. the presence of a value component that reveals the value orientations characteristic of the carriers of a certain linguistic culture.

According to V.I. Karasik, “Value, the highest guidelines, determine the behavior of people and constitute the most important part of the language picture of the world. Values do not exist in isolation, but are interconnected and constitute a valuable picture of the world” [11:136].

Based on the analysis of linguistic literature, it seems to us appropriate to list a number of distinctive features of the linguocultural concept:

- multi-layered organization: concept is a multidimensional formation, including a combination of the following components: conceptual, associative-figurative and value components.

- semiotic density (nominative): concepts can be represented by a number of lexical, phraseological and paremiological units, folklore and literary works [11:111];

- anthropocentric orientation, which implies a focus on the human factor in the language: the concept is a complex cognitive structure that is formed in the course of the cognitive and communicative activity of the individual;

-projection of the linguistic and conceptual picture of the world;

-cultural aspect: the concept is a “clot of culture”, a link between a person and the reality surrounding him; concept is a mental formation, marked by ethno-cultural specifics and having internal semantic dismemberment [10:13].

Speaking about the cultural specificity of concepts, we consider it relevant to refer to the study of R.I. Frumkina, in which she distinguishes two types of concepts: a) concepts with a universal meaning, and b) concepts of national and cultural conditioning.

The last type includes concepts: a) marked by linguocultural specifics, and b) being the key to understanding the national mentality [12:3-10].

So, according to the classification of R.I. Frumkina, the division into the above types of concepts is based on the distinction according to the whole-private principle, or in other words, universal and specific.

However, the analysis of a number of studies, as well as our own observations, indicate that even universal concepts are marked by a certain national and cultural specificity. In this regard, in our opinion, both types of concepts are characterized by ethno-cultural specifics.

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Rezyume: Ushbu maqolada lingvokulturologiyada kontseptsiyani o'rganishga yondashuvlar muhokama qilinadi. Tilshunoslikda kontseptsiyani o'rganish ikkita asosiy yo'nalish doirasida amalga oshiriladi: kognitiv va lingvokulturologik. Biz ushbu tushunchani lingvokulturologiya nuqtai nazaridan ko'rib chiqamiz. Shuningdek, ba'zi tilshunoslarning lingvokulturologiyada kontseptsiyani o'rganish bo'yicha fikrlari va ta'riflari keltirilgan.

Резюме: В данной статье рассматриваются подходы к изучению концепта в лингвокультурологии. В лингвистике изучение концепта осуществляется в рамках двух основных направлений: когнитивного и лингвокультурологического. Мы рассматриваем это понятие с точки зрения лингвокультурологии. Также приводятся мнения и определения некоторых лингвистов об изучении концепта в лингвокультурологии.

Kalit so'zlar: lingvokulturologiya, tushuncha, yondashuvlar, tushuncha, milliy-madaniy o'ziga xoslik.

Ключевые слова: лингвокультурология, концепция, подходы, понятие, национально-культурная специфика.

HEREDITY AND VARIABILITY OF ONE STEM WEIGHT IN F₂ PLANTS OF GOOSE VARIETIES OF THE G.HIRSUTUM L. GENUS

Absattarov N.A., Zarlykov A.Sh.

Karakalpakstan Institute of Agriculture and Agro-Technology

Summary: *This article discusses the most important agricultural indicators of cotton, cotton weight, the main components of plant productivity, as well as the main factors determining yield.*

Keywords: *Cotton, economic indicators, cotton weight, plant yield, components, yield, main factors.*

INTRODUCTION.

Most of the economically valuable traits of cotton have a complex structure, and this complexity depends on a number of structural parameters. For example, economic indicators - cotton weight per bag, fiber yield, fiber length and several quality indicators are the main factors.

However, some varieties are genotypically and phenotypically very diverse, and the level of the limit (minimum and maximum range of indicators) has a very high indicator. This creates difficulties in production by causing several problems. As a result, farmers cannot fully satisfy their demands. The main reason for this is that the characters do not have a certain balance. Violation of the balance of signs leads to a sharp drop in yield and quality [2, 3, 4].

One of the most important economic indicators of cotton is the weight of cotton in one boll. Cotton weight per bag is one of the main components of plant productivity and is one of the main factors that create productivity. Therefore, special attention is paid to studying the manifestation, heredity and variability of this trait in genetic and selection studies.

Studying this sign is a very difficult and responsible task. Because the limit (minimum and maximum range of indicators) of the weight of cotton in a bud opened in one plant is very high, which makes the analysis difficult. However, this weight gain only serves to increase the weight of the crop.

In the scientific literature [1], it is noted that the weight of cotton in one bag is relatively less variable in environmental conditions.

Cotton weight in one bag of G.hirsutum L. cotton cultivars participated in our experiments was 6 in AN-Boyovut-2, S-6524, Namangan-77, Dehqanbob and AN-130 varieties picked from the parent nursery, respectively. 6.0 g., 5.6 g., 6.0 g., 5.8 g. and 6.3 g. formed

In our research, the extent of variation in the weight of cotton per boll was studied in AN-Boyovut-2, S-6524, Namangan-77, Dehqanbob and AN-130 varieties and in combinations of their 6 reciprocal F₂ hybrids. The scale of variation for this character occupied 4 classes in AN-Boyovut-2, S-6524 and Dehqanbob varieties, and 5 classes in Namangan-77 and AN-130 varieties. The highest percentage of plants is 5.1-5.5 g in AN-Boyovut-2 and Dehqanbob varieties, 4.6-5.0 g in S-6524 and Namangan-77 varieties, 6.1-6 in AN-130 variety, 5 g. was noted in indicative modal classes. The highest marginal class index of cotton varieties is 5.6-6.0 g in the S-6524 variety. and plants belonging to this class equaled 16.7%. AN-Boyovut-2, Namangan-77 and Dehqanbob varieties have the highest edge class index of 6.1-6.5 g. and plants belonging to this class were 10.0%, 16.7% and 20.0%, respectively. AN-130 variety had the highest edge class indicator (7.1-7.5 g.) was superior to other varieties, and it was observed that the plants belonging to this class were 6.7%. The coefficient of variation of the sign in the varieties was 8.27-9.71%. This indicates that the studied character is less variable in all varieties (Table).

In the F₂ plants crossbred from these cotton varieties in the reciprocal method, the weight of cotton per boll is 4.3-8.5 g in total combinations. in the interval, the character appeared according to which cotton variety was taken as the parent form.

5.1-5.5 g in AN-Boyovut-2 variety. the indicative class contained the highest percentage of plants studied (36.7%) and was the modal class, with cultivar S-6524 having the highest percentage of plants at 4.6–5.0 g. observed in class (40.0%). In hybrid combination, the weight of cotton in one bag is 4.5 g. from 7.3 g. up to 7 classes, mostly 4.1-7.5 g. and the average indicator is 5.4 g. , the coefficient of variation was equal to 13.7% and it was shown that the character of cotton weight in one plant was moderately variable. The coefficient of transmission of the character from generation to generation was equal to $h^2=0.43$, which indicates that 43% of the studied cotton weight character in one boll is the genotype of the hybrid form, and 57% is inherited under the influence of the external environment. The main part of the plants is 5.1-5.5 g of the variation series. located between 32, made 5%. In the reciprocal hybrid combination, the weight of cotton in one bag is 4.3 g. from 8.5 g. up to 7 classes, mostly 4.1-8.5 g. and averaged 5.8 g. formed

It should be noted that plants in classes 7.1-7.5 and 7.6-8.0 were not recorded. The coefficient of variation of the sign was equal to 16.3%, and a moderate level of variability of the sign was observed. Plants are mostly 5.6-6.0 g, with the variation range shifted to the right. and was 27.5%. The coefficient of inheritance of the character was equal to $h^2=0.67$. It was observed that 67.0% of the studied characteristics of the weight of one bag of cotton were inherited by the genotype of the hybrid form, 33.0% by the influence of the external environment.

4.6-5.0 g of the studied plants in Namangan-77 cotton variety. we can see in the class, that is, the plants in this class made up 26.7%. In the Dehqanbob variety, the highest percentage is 5.1-5.5 g. was recorded in the class and took 46.6%. In the combination of the second generation Namangan-77 x Dehqanbob hybrid of these varieties, the weight of cotton per boll is 4.0 g. from 6.5 g. plants up to 6 classes were observed. Placement classes of plants 3.5-6.5 g. was in the range, and the highest percentage according to this sign is 4.6-5.0 g. was observed in class (30.0%), the average indicator of the mark is 5.3 g. formed

The coefficient of variation of the sign was equal to 11.1%, and the variability of the sign was shown to be moderate. A shift to the left in the variation series of plants by 2 classes was noted, and it was observed that the coefficient of inheritance of the trait was $h^2=0.08$, which indicates that the plants in this combination were mainly inherited under the influence of the external environment.

In the reciprocal hybrid combination, the weight of cotton in one bag is 4.4 g. from 8.1 g. up to 8 classes, and plant location classes 4.1-8.5 gg. settled in between. The highest percentage of plants is 6.1-6.5 g. class (27.5%), and the average indicator for this sign is 6.1 g. formed The coefficient of variation of the sign was equal to 13.1%, and the variability of the sign was shown to be moderate. Plant variation series 3 classes shift to the right and plant weight 7.6-8.0 g. we can see that it is not observed in class . The coefficient of inheritance of the character was equal to $h^2=0.51$, which means that 51% of the character of the cotton weight in one boll was inherited by the genotype of the hybrid form, 49% by the influence of the external environment.

6.1-6.5 g of AN-130 cotton variety according to this sign. the indicator class contained the largest percentage of plants (46.7%) and was the modal class. In the Namangan-77 x AN-130 hybrid combination, the weight of cotton in one bag is 4.5-7.4 g. is equal to, divided into 7 classes, 4.1-7.5 g. placed in class intervals and the average indicator is 5.9 g. formed Plants are mostly 6.1-6.5 g. was registered in the class and took 27.5%.

Table

**Cotton weight per boll in parental plants and its variation in F₂ generations,
and average weight analysis**

№	Varieties and hybrid combinations	Number of plants	Grades, g (in percent)										M±m	σ	limit	V, %	h ²
			3.5-4.0	4.1-4.5	4.6-5.0	5.1-5.5	5.6-6.0	6.-6.5	6.6-7.0	7.1-7.5	7.6-8.0	8.1-8.5					
1	AN-Boyovut-2	30	-	-	23.3	36.7	30.0	10.0	-	-	-	-	5.5±0.10	0.53	4.2-6.2	9.51	
2	F ₂ AN-Boyovut-2xS-6524	120	-	7.5	25.0	32.5	17.5	7.5	2.5	7.5	-	-	5.4±0.10	0.75	4.5-7.3	13.7	0.43
3	F ₂ S-6524xAN-Boyovut-2	120	-	10.0	15.0	12.5	27.5	15.0	15.0	-	-	5.0	5.8±0.15	0.95	4.3-8.1	16.3	0.67
4	S-6524	30	-	16.7	40.0	26.6	16.7	-	-	-	-	-	5.1±0.09	0.47	4.2-6.0	9.27	
5	Farmer	30	-	-	16.7	46.6	20.0	16.7	-	-	-	-	5.5±0.08	0.45	4.8-6.4	8.27	
6	F ₂ Namangan-77xDehkanbob	120	2.5	10.0	30.0	27.5	20.0	10.0	-	-	-	-	5.3±0.09	0.58	4.0-6.5	11.1	0.08
7	F ₂ DehkanbobxNamangan-77	120	-	2.5	7.5	17.5	17.5	27.5	22.5	2.5	-	2.5	6.1±0.13	0.80	4.4-8.1	13.1	0.51
8	Namangan-77	30	-	10.0	26.7	23.3	20	20	-	-	-	-	5.4±0.12	0.63	4.3-6.5	9.71	
9	F ₂ Namangan-77xAN-130	120	-	5.0	15.0	17.5	15.0	27.5	17.5	2.5	-	-	5.9±0.12	0.76	4.5-7.4	12.9	0.30
10	F ₂ AN-130xNamangan-77	120	-	-	-	12.5	10.0	15.0	17.5	30.0	10.0	5.0	6.8±0.13	0.83	5.2-8.4	12.3	0.49
11	AN-130	30	-	-	-	10.0	26.6	46.7	10.0	6.7	-	-	6.1±0.12	0.64	5.3-7.3	9.42	

The coefficient of variation of the sign was equal to 12.9%, and it was observed that the sign of the weight of cotton per bag changed to a moderate extent. As the variation line of the plants shifted to the right, the

coefficient of transmission of the trait from generation to generation was $h^2=0.30$, which indicates that 30% of the cotton weight in one boll of the trait was inherited by the genotype of the hybrid form, and 70% by the influence of the external environment.

In the reciprocal hybrid combination, the minimum and maximum indicators of plants are 5.2-8.4 g. is equal to, in 7 classes, i.e. 5.1-8.5 g. placed in the classes between them. The largest percentage of studied plants is 7.1-7.5 g. 30.0%, and the average value is 6.8 g. was equal to The coefficient of variation of the sign was equal to 12.3%, and the variability of the sign was shown to be moderate. As the variation series of plants shifted to the right, the coefficient of transmission from generation to generation was equal to $h^2=0.49$. It was observed that 49% of the studied cotton weight in one boll was inherited by the genotype of the hybrid form, 51% by the influence of the external environment.

In F_2 plants, the trait transmission coefficient (h^2) was low in Namangan-77 x Dehkanbob combination, while it was moderate in other combinations. The AN-130 x Namangan-77 hybrid combination showed a higher result of the trait transmission coefficient (h^2) in reciprocal hybrid F_2 plants of *G. hirsutum* L. than other hybrid combinations.

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Rezyume: Ushbu maqolada g'o'zaning eng muhim xo'jalik ko'rsatkichlari, paxta vazni, osimlik mahsuldorligining asosiy tarkibiy qismlari hamda hosildorlikni yaratuvchi asosiy omillari yoritilgan.

Резюме: В этой статье рассматриваются наиболее важные сельскохозяйственные показатели хлопка, вес хлопка, основные компоненты продуктивности растений, а также основные факторы, определяющие урожайность.

Kalit so'zlar: G'o'za, xo'jalik ko'rsatkichlari, paxta vazni, o'simlik mahsuldorligi, tarkibiy qismlar, hosildorlik, asosiy omillari.

Ключевые слова: хлопок, экономические показатели, масса хлопка, продуктивность растений, компоненты, продуктивность, основные факторы.

THE IMPACT OF COMPUTER TECHNOLOGIES ON THE PSYCHOLOGY OF PRESCHOOL CHILDREN (BY THE EXAMPLE OF GADGET TECHNOLOGIES)

Esnazarova Z. O.

Nukus State Pedagogical Institute

Summary: *This article presents the prevention of computer addiction in children and reduce the possible negative impact of electronic devices and use adhering to several important rules.*

Keywords: *Gadget, technology, mental disorder, preschool children, diction, information acquisition, psyche, vision, brain, norm.*

INTRODUCTION.

Strengthening the health of children, the harmonious development of the forms and functions of the body, increasing efficiency, increasing resistance to various external influences, ensuring longevity, as well as the susceptibility characteristic of preschool children, the ability to easily adapt to changing conditions, makes it possible to perform a number of educational tasks: the necessary skills are the formation of skills and abilities, the development of physical qualities (agility, strength, endurance, speed, flexibility, balance, guessing the eyes), various upbringings, hygiene skills, the assimilation of knowledge about physical culture.

Motor skills in a child (crawling, walking, jogging, cycling, etc.) are relatively light in form, they facilitate the child's communication with the environment. The child gets acquainted with the properties of the bark and wind when sledding, with the properties of water when swimming in water. On this basis constitute the physical musculature, hygiene associated with the acquisition of skills and acquired initial knowledge.

Children should know the name of body parts, direction of movement (up, down, forward, left, right), rotation of the body, the name of physical education devices and the use of rations, their storage and retention, care for clothes and shoes.

Hardening of the child's body is a system of measures aimed at strengthening the body, developing endurance, resistance to harmful effects, the ability to quickly adapt to changes in living conditions [1. P.385].

The modern world is almost impossible to imagine without all kinds of gadgets: computers, mobile phones, tablets. Watching adults who are carried away by "advanced things", children, with their naivety and curiosity, at the subconscious level begin to perceive this technique as an obligatory aspect of being. But how can the impact of modern gadgets on a child turn out to be? Let's try to consider in more detail the problem of the influence of electronic devices on the child's psyche: is it possible to allow children to use mobile electronic devices, at what age, with what frequency, and also whether communication with gadgets really harms the baby, and how to avoid child dependence on modern gadgets, so densely filled our living space.

Prolonged exposure to gadgets from an early age irreversibly thins the cerebral cortex and slows down mental development, and this is confirmed by studies by scientists from foreign countries. For example: scientists from the US National Institutes of Health found that children who use gadgets often and for a long time permanently change the structure of the brain. For ten years, they followed 11,000 children, brain scans showed that the brain structures are irreversibly changing, and its cortex becomes thinner, scientists from Canada also came to disappointing conclusions: they watched 2,500 babies two to five years old (children spent gadgets over 17 hours a week), as a result, such children developed mental abilities more slowly than their peers who were not so passionate about mobile devices, Korean scientists found that children addicted to gadgets are more likely to experience anxiety,

In addition, electromagnetic security claims that electromagnetic radiation from modern electronic gadgets has a negative impact on the central nervous system. Moreover, it is the children's body that is most susceptible to this influence. A qualitative analysis of the groups of

children participating in the research showed that if they regularly use tablets and smartphones, they are characterized by distracted attention and a decrease in the IQ.

Sanitary and epidemiological standards strongly discourage children from using gadgets with high-frequency electromagnetic radiation: phones, smartphones, tablets [2.].

Mental development refers to the process of developing the strength of the intellect and thinking, resulting from life impacts and all micro-enterprises. Along with the term "mature mind", the term "reasonable maturity" is also used.

Reasonable maturity is a set of quantitative and qualitative changes that occur in the child's activities in connection with his growing up and enrichment with experience.

At the age of preschool education, knowledge is rapidly enriched, speech is formed, cognitive processes are improved, the child masters the simplest methods of activity. Ensuring the intellectual development of preschool children is of great importance for all their future activities. The child develops mentally under the influence of the social environment. In the process of communicating with people around him, he integrates the language, and with it the content as a whole system of concepts. As a result, from preschool age, the child learns the language so much that he becomes able to freely use it as a means of communication.

Z.I.Kalmykov offers the following definition: academic development is a complex dynamic system of quantitative and qualitative changes due to the individual characteristics of the human psyche, the growth of life experience in connection with the socio-historical conditions in which he lives, and his intellectual activity associated with age [3. P. 385.].

Studying the issue, scientists have compiled a list with the main side effects:

- rather strong nervous disorders: they may be accompanied by nervous tics, speech impairment, stuttering and "swallowing words";

- mental disorder in general: as a rule, this is aggression in all its manifestations - it can manifest itself at the moment when you are trying to take a gadget from a child, or maybe in any other circumstances; it happens that in order to break loose, the baby just needs to do something differently than he intended; it happens that children try to physically attack parents (with fists or objects);

- due to mental disorders, normal sleep disappears: frequent nightmares, insomnia, "broken" state in the morning - the first sign of addiction;

- the process of eating goes astray: this happens when your child is used to eating with a tablet (computer, phone) that is always on. feel the taste of food. They do not even fully understand the feeling of hunger or satiety;

- the emergence of persistent addiction: this is related to drug addiction and alcoholism: it is enough for parents to leave the child with a tablet or computer for an unlimited time several times, and a vicious circle arises - the child increasingly asks for a device, and adults increasingly get free time;

- incomplete assimilation of information: gadgets help children's development, but kids at an early age need to use all channels of perception - it is important for a child to touch, twist, examine the ball from all sides in order to understand that it is round and can roll, while educational cartoons are not able to show all the diversity of the world, therefore the child cannot fully study a particular subject;

- decrease in creative activity: not a single computer, laptop or smartphone can replace the real work with various materials for children, the joy of creating something new with their own hands; in real life, kids fantasize and embody ideas in modeling, cutting, coloring, creating applications, and dependence on gadgets deprives them of this opportunity;

- the psyche of children adapts to technical devices: as a result, the thinking and perception of the child change - bright visual images evoke strong emotions, but leave the child's thinking indifferent, as a result, the main channels of perception for him become vision and hearing;

- a child cannot cope with an overabundance of information received with the help of modern technical devices, which leads to violations of the emotional and volitional sphere, children

become emotionally unbalanced, unable to control their actions, they may also experience a feeling of poor health, susceptibility to stress;

- escape to the virtual space: of course, not every child replaces the real world with a computer game, and yet, some children become seriously dependent on gadgets, focusing all their interests on the virtual world: not only communication with peers suffers, but also relationships with parents;

- in children who play a lot and often "shooters", their worldview is distorted: the child associates himself with an immortal computer hero and gets used to the fact that if he is "killed", you can start the game again - the sense of self-preservation is dulled, and now he is on the street it seems that he is able to perform some dizzying trick with ease and without risk to his life; the child begins to believe that resolving any conflicts with the use of force and weapons is the norm, and does not even try to resolve quarrels in real life peacefully, he simply does not know how to do it; heroes of computer games are not responsible for the most cruel acts and murders - this behavior model is transferred by a child to the real world: you can hit, beat your opponent to the blood - and you will not get anything for it! and if the hero of the game jumps from a height without breaking,

"Farm Farm" or "Beauty Salon", in complete psychological safety - another aspect of the negative impact of computer games on children - games kill the ability to work, make efforts to achieve results. Children get used to the fact that a couple of mouse clicks solves any problem - and here you are a hand-written beauty, your computer pet is fed and happy, the farm is flourishing.

They then transfer this wrong model of behavior to real life - hence depression, stress and tantrums, when something does not work out the first time, when you need to try to make it work. Such games cause addiction in the child.

In addition to the harm from direct radiation, there are additional health hazards from the active use of tablets and other similar devices:

This aspect of the influence of gadgets on children is worth considering in more detail. If a child is overly fascinated by a tablet or laptop, then it may suffer:

1. Vision - if the baby spends more than half an hour a day at the monitor, there is a risk that after six months his visual acuity will decrease significantly, because children's eyes are under a huge load;

2. Posture - children at the computer often stoop, which is fraught with curvature of the spine and numerous difficulties with posture in the future;

3. Brain - from a long stay in one position, blood circulation in the limbs, internal organs can be disturbed, the brain suffers, too, which has an extremely negative effect on the child's intelligence, is fraught with a decrease in concentration and memory.

4. For children spending hours behind the touch screen, problems begin with the coordination of actions between brain commands and hand movements. In the studied groups of children, there were cases when such guys could not even throw the ball in a straight line, because the upper limbs did not adequately respond to signals from the head [4].

If we want to prevent the emergence of computer addiction in children and reduce the possible negative impact of electronic devices, we need to use them correctly, adhering to several important rules, and this is first dependence on gadgets can develop if parents begin to replace real interaction with the baby with various electronic devices: do not use the computer to captivate the child while you are preparing dinner or doing cleaning, secondly, it is necessary to fix in the mind of the child that you only need to use all the equipment with the permission of the parents, whether it be a TV, a computer or a tablet - this should become a rule that is not discussed; thirdly, at any age, a child must clearly know how much time per day he can spend at a computer or with a tablet; the baby was at the computer more than the established age norms. Based on how old the child is, it is possible to determine the allowable rate of stay in front of the monitor, and these are children 4-5 years old - no more than 15 minutes; 6 years - 20 minutes; 7-9 years - 30 minutes; 10-12 years - 40 minutes; 13-14 years old - 50 minutes and 16-18 years old - 60 minutes.

If it turns out that the lesson involves a longer stay in front of the monitor, you need to take at least 10-minute breaks. These numbers may seem rather harsh. But, according to experts, even an adult should not work at a computer continuously for more than an hour. And also it is necessary to adhere to the age recommendations indicated for computer games and cartoons.

If a child is little interested in something other than a computer, do not stop offering him new and new joint games and entertainment, sooner or later you will pick up a game for him to taste. Children in everything take an example from their parents, therefore, in order to interest a child in a useful game, you need to play it with him. In addition, you should not play games in front of the baby, the passion for which will not bring him any benefit. Clearly track your child's information field when interacting with gadgets (cartoons, games, posts, etc.) information intended for older people can overload the child and even lead to a nervous breakdown, psychosis, behavioral disorders, and gadgets should not be given to kids before falling asleep: from the flickering of bright pictures on the screen, the nervous system of children is excited, which is why they sleep poorly, see nightmares in their sleep or cannot sleep at all. Despite all the advantages of gadgets, remember that tablets or phones are not essential items for preschoolers and toddlers. Full development is possible without all these "miracles of technology", but if you still want to please your child, then follow the principle - the technology for the child should correspond to his age: for children under six years old, it is better to purchase children's tablets that are designed specifically for this age group. period. In this case, you will be sure that the gadget is useful for the child, and it will become much easier for you to control the enthusiastic child. Full development is possible without all these "miracles of technology", but if you still want to please your child, then follow the principle - the technology for the child should correspond to his age: for children under six years old, it is better to purchase children's tablets that are designed specifically for this age group. period. In this case, you will be sure that the gadget is useful for the child, and it will become much easier for you to control the enthusiastic child. Full development is possible without all these "miracles of technology", but if you still want to please your child, then follow the principle - the technology for the child should correspond to his age: for children under six years old, it is better to purchase children's tablets that are designed specifically for this age group. period. In this case, you will be sure that the gadget is useful for the child, and it will become much easier for you to control the enthusiastic child.

In our country, in the 80s and 90s of the 19th century, the idea of creating a system of preschool social education began to develop. The enlightened local intelligentsia, who lived and worked at that time, began to look for a solution to this problem, given the plight of women and unruly children. In particular, in 1872, representatives of the intelligentsia, who were part of the "Charity Society" founded in Turkestan, established shelters (orphanages) for children who did not find their parents, in the same building with houses for the poor, sleeping places, the first born, etc. d. These orphanages, in which 150-200 children live throughout Turkestan, bring up children of 10 years of age and children of school age [5. P.160.].

As we know, the 21st century is the century of technology and progress, which means that the skills and abilities in this area will be useful to kids in the future. Therefore, it is still not necessary to forbid children to use modern achievements of technology. It is only necessary to take this process competently and seriously: do not use gadgets to compensate for the lack of parental attention; you need to monitor the time that your child spends on a tablet or smartphone, and use the phone less often when the baby is around.

We ourselves are an example for our children that real communication with a child cannot be replaced by any, even the most expensive and newfangled devices; you need to pay attention to changes in behavior: you should pay attention to those who regularly play gadgets, become irritable, nervous, poorly controlled, they have tantrums that they didn't have before, attacks of aggression for trifling reasons, enuresis (so the child's psyche can compensate for the load, which she receives in the process of using mobile devices, the tension and excitement in which the child is playing, for example, a "shooter", unexpected plot twists, strong excitement cannot disappear without a trace

and then manifest themselves in such unexpected changes in behavior for parents) . If you observe similar signs in your child's behavior, you need to reduce or exclude his "communication" with gadgets, since these are the first signals of the formation of computer addiction, and it is difficult to get rid of such dependence.

Based on the issues discussed above, if you speak in a simple language for everyone, covering simple content (rule), you need to follow the rules, be more interested and worried about your child, spend time with him, show him that there are other forms of leisure - sports, books, board games. games, hobbies. An even simpler rule is don't let computer characters raise your child instead of you.

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Rezyume: *Ushbu maqolada bolalarda kompyuterga qaramlikning oldini olish va elektron qurilmalar va ulardan foydalanishning mumkin bo'lgan salbiy ta'sirini kamaytirish, bir nechta muhim qoidalarga rioya qilish ko'rsatilgan.*

Резюме: *В данной статье представлен не допущение возникновения зависимости от компьютера у детей и снизить возможное отрицательное влияние электронных устройств и использовать придерживаясь нескольких важных правил.*

Kalit so'zlar: *gadjet, texnologiya, ruhiy buzuvlik, maktabgacha yoshdagi bolalar, giyohvandlik, axborotni o'zlashtirish, psixika, ko'rish, miya, me'yor.*

Ключевые слова: *гаджет, технология, нарушение психики, дошкольники, зависимость, освоение информации, психика, зрение, головной мозг, норма.*

TERMS ON ECOLOGY IN CRIMINAL LAW

Utemuratova S. Sh.

Karakalpak State University named after Berdakh

Summary: *this article analyzes the terms related to the field of Ecology in criminal law.*

Keywords: *Ecology, Environment, Environmental, Criminal Code.*

"Ecology" - Greek "oikos" - means home and "logos" - doctrine. The founder of ecology is the German biologist E. Geckel (1834-1919), who first used the term "ecology" in 1866. He wrote: "by ecology we mean the general science of the relationship between the organism and the environment, where we refer to all the "conditions of existence" in the broad sense of the word. They are partly organic and partly inorganic".

Literally translated, ecology means "home, the doctrine of living". "Ecology" is used to express a special science of the interaction of living organisms, including humans, with each other and with the environment. From inanimate, infinite nature, organic, living nature gradually emerged. Due to the increased influence of man on the natural environment, ecology is gaining importance as a scientific basis for the rational management of nature and Environmental Protection. The term ecology was gradually concretized in relation to nature: a natural home, a place of residence of a person, the doctrine of people. As a diligent, caring landlord, a person not only takes care of him, protects and improves him. Man lives in nature and therefore interacts with it. This interaction is manifested in nature management and conservation.

Nature management and conservation represent social relationships between people in the field of nature management and nature conservation. They are legally regulated by the nature Management Law and the nature, environmental protection legislation, that is, they are two branches of this legislation; together they constitute a complex branch of environmental legislation as two interconnected branches.

In the middle of the 20th century, nature in science began to be called "natural environment", sometimes simply "environment", and often simply "habitat". In such cases, we mean nature, natural environment. All these concepts and terms were subsequently consolidated and reflected in environmental legislation.

Here we want to focus on some of the terms that are found in the structure of the criminal law part of crimes in the field of Ecology. Several terms related to ecology can be found in the Criminal Code of the Republic of Uzbekistan. For example, chapter XIV of the criminal code, known as crimes in the field of ecology, is called, as mentioned above, "crimes in the field of Environmental Protection and the use of nature." Article 2 of the Criminal Code states that one of the tasks of the code is the protection of the natural environment. And in articles 194-204 of Chapter XIV of the Criminal Code, the term "environment-natural environment" is used.

In scientific works related to the protection of Ecology, current laws and practices, several terms can be found in this area, including: "protection of the natural environment", "protection of the environment", "protection of nature", "protection of Natural Resources" and others.

A well-known scientist in the field of Environmental Law O.S.Kolbasov noted, the development of terms on law correlates with its discussion and formation. In fact, the demand for understanding the meaning of legal terms has always been high. Knowing the true meaning of a word has its effect on the correct application of that word.

Analysis of the above terms in terms of content in kilingan, each of them can mean different meanings. These and other environmental terms are well-known scientists (O.S.Kolbasov, M.M.Brinchuk, O.N.Dubovik, A.K.Despite the fact that it was studied by Golichenkov and others), until now there has not been a single opinion on these terms.

The term "environment" is often used as concepts used interchangeably, meaning the same as the term "environment natural". In our opinion, the concept of "environment" is broader than the

concept of "environmental natural environment". By environment we can understand any environment (not only natural) around a person. For example, the environment of the daily, production and others, through which most of a person's life passes, "...the concept of the environment can also be applied to natural objects (since they are around man), only this does not include production, non-natural objects". Hence, by the environment, one can understand the natural and non-natural environment, and this means wider than the "natural environment".

Assuming that these three different terms are used by the legislator as words that mean the same meaning, it is unconditional that the use of three different terms in the same law itself leads to different interpretations of the law. Because to reveal the meaning of these concepts, the meaning of each word in it is investigated. For example, if the word "natural" is given in one concept, then the second does not. Also with the name of the chapter (XIV), it is noticeable that the substances specified in IT (articles 193-196 of the Criminal Code) are incompatible.

If we consider that these three concepts were used in three different meanings, the first, as mentioned above, means wider than the second.

In our opinion, it is more expedient to use the term "environment" instead of the three different terms used in the Criminal Code, considering the concept of "environment" as a broader concept than the concepts of "Environment" and "natural environment".

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Резюме: Maqolada jinoyat qonunchiligida ekologiya sohasiga oid atamalar tahlil qilinadi.

Резюме: в статье анализируются термины присущее экологии в уголовном законодательстве.

Kalit so'zlar: ekologiya, atrof muhit, atrof tabiiy muhit, jinoyat kodeksi.

Ключевые слова: экология, окружающая среда, окружающая природная среда, уголовный кодекс.